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SUMMER 1989

■ A PUBLICATION OF THE NORTHWEST ■
COALITION FOR ALTERNATIVES TO PESTICIDES

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International Pesticide Issues

A Global Community of Activists Who Count On Each Other

Every person working for pesticide reform comes to the work with a different story and history. This is certainly true within the international pesticide reform movement, where people from tremendously different backgrounds and experiences blend their strengths to challenge global pesticide abuse. Pesticides and their residues are produced, used, and shipped all over the world. It simply stands to reason that *solutions* to pesticide dependency will also come from many countries.

In the same way that we learn from the experiences and diversity of pesticide reform campaigners in other countries, other movements for environmental and social justice offer insights into the nature of our work, and how to move forward.

With analysis developed by the peace movement, for example, we can see pesticide dependent control strategies as based on chemical violence. This violence has biological, economic, and political, and psychological aspects. The word "pesticide" itself describes biological violence, and many product tradenames accurately report the themes: Ambush, Eradicane, Fusilade, One-Shot, on and on.

The toxics movement has extensive

experience dealing with economic, political, and psychological violence, to which many community people addressing pollution from chemical manufacture, use, and disposal can attest. Nor is the inherent violence of playing off the health of different groups limited to use worldwide.

PAN International and the organizations working within it are important components of the joint effort that will, if anything can, make rational pest control a worldwide reality.

The process of implementing sane and equitable pest control policies is part of a larger, high-stakes experiment to bring under control the industrial technologies unleashed and proliferated during this century. This issue of JPR illustrates how the international pesticide reform movement is growing towards a global community of activists

who count on each other—and who insist upon their right to participate in pest control decisions that affect lives everywhere.

—Monica Moore,
Director, PAN North America
Region Center

PAN North America Region Center;
P.O. Box 610; San Francisco, CA 94101;
Tel. (415) 541-9140.

Pesticide Non-Trivia Quiz

(Answers at bottom of page 50)

1. United States pesticide sales represent about _____ (fraction) of the world market.

2. Annual U.S. pesticide user expenditures were about _____ dollars in 1987.

3. Agriculture accounts for over _____ (fraction) of U.S. pesticide user expenditures and volume used.

4. _____ (type of pesticides, e.g., fungicides, insecticides, herbicides) is the leading type of pesticide in terms of user expen-

diture and volume used.

5. About _____ pounds active ingredient of conventional pesticides are used in the U.S.

6. Total U.S. pesticide usage in 1987 was about _____ pounds of active ingredient. (Figure includes wood preservatives, disinfectants, and sulfur.)

7. Farmers' expenditures on pesticides represent slightly less than _____ percent of total farm production expenditures.

8. Total pesticide research and development (R & D) expenditures by chemical manufacturers represent about _____ percent of pesticide expenditures by the user community.

9. The two most widely used pesticides in the U.S. by volume are _____ and _____.

10. _____ new active ingredients were registered by the U.S. Environmental Protection Agency in 1987.

11. There are about _____ certified pesticide applicators in the U.S.

12. There are about _____ documented pesticide deaths each year in developing nations.

13. According to the United Nations, _____ pesticide poisonings take place in the world every minute, more than _____ annually.

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What Can Be Done in North America? PAN and Others Work for Worldwide Pesticide Reform

By Sonya Griffith

Webster's dictionary defines the word "book" as "a set of written, printed or blank sheets bound together into a volume;" also "something regarded as a source of enlightenment or instruction;" and "the total available knowledge and experience that can be brought to bear on a task or problem." *Circle of Poison: Pesticides and People in a Hungry World* by David Weir and Mark Shapiro has become a book encompassing all three senses of the word.

Circle of Poison, a set of printed sheets bound together in 1981, enlightened people about problems associated with international pesticide use and urged citizens to cooperate globally to solve the problems. Although the publication did not itself represent the total knowledge and experience available for international pesticide reform, it sparked the formation of an organization that comes close: Pesticide Action Network (PAN) International.

PAN is Born

In 1981, activists worldwide read *Circle of Poison*, which the San Francisco publisher, Food First, distributed internationally. Citizens around the globe spontaneously heeded the call for cooperation and met that year in Frankfurt to discuss how to help each other deal with pesticide problems, both local and global in nature.

These talks led to a 1982 interna-

Sonya Griffith is a freelance writer with a particular interest in environmental issues. Her article, "Defeating a Tasmanian Pulp Mill: An International Effort to Reduce Dioxin Proliferation," appeared in the spring 1989 issue of the Journal of Pesticide Reform (JPR 9(1):12-17).



PAN Links

In collaboration with other regional offices, PAN North America (PAN NA) tries to link people who have questions to the nearest people who have answers. Volunteers, interns, and part-time workers at the organization search for answers to questions, asked mostly by southern countries. (Other North American organizations, such as NCAP, respond primarily to questions from northern countries.) When PAN workers don't know or can't find an answer, they refer the questioning party to someone who can.

PAN routinely searches for organizations that offer information and services to and among southern countries and disseminates materials about these other organizations so citizens of the southern countries can select materials and resources relevant to them. The aim is to collaborate without duplicating efforts.

"The developing countries' need is too great for any one organization to fulfill," notes Doria Mueller-Beilschmidt, PAN North America information service coordinator.

Mueller-Beilschmidt is currently organizing PAN North America's library out of three private collections of pesticide resources. She estimates there are 6,000 items in all. As currently planned, the library will be entered onto the computer, and access to the database will then be made available through Econet, a nonprofit, international telecommunications system. Portions of the database, which will change regu-

larly, will be displayed for browsing. Viewers will be able to order printouts from the PAN NA office.

Mueller-Beilschmidt notes, however, that much of the database content will have little value for southern countries. A printout of a bibliography, for example, would be worthless to someone living in a country without access to the resources indexed. Such databases, however, help people in the North do research that eventually aids people who want to decrease, eliminate, or avoid pesticide use in the South.

The Dirty Dozen: PAN's First Major Global Reform Effort

PAN's Dirty Dozen Campaign, agreed upon in 1984 at the PAN International Conference in Utrecht, Netherlands and launched globally on World Environment Day (June 5) 1985, marks the first major global effort to end pesticide abuse and dependence. The campaign targets certain particularly hazardous pesticides known to cause significant health and environmental problems: aldicarb (Temik), camphochlor (Toxaphene), chlordane and heptachlor, chlordimeform, DBCP, DDT, the "Drins" (aldrin, dieldrin, endrin), EDB, HCH/BHC and lindane, paraquat, ethyl and methyl parathion, pentachlorophenol, and 2,4-T.

To be a member of the Dirty Dozen club, a pesticide must fulfill such criteria as 1) being banned or restricted in exporting countries or considered dangerous by the World Health Organization or northern countries; 2) being widely sold, particularly in southern countries; 3) having documentation of causing health hazards or injury; and 4) being illustrative of broader issues posed by pesticides in general.

The campaign's fundamental goal is to end the use of these pesticides wherever their use poses hazards and to replace them with alternative resource management or pest control systems. Broader Dirty Dozen Campaign goals are to:

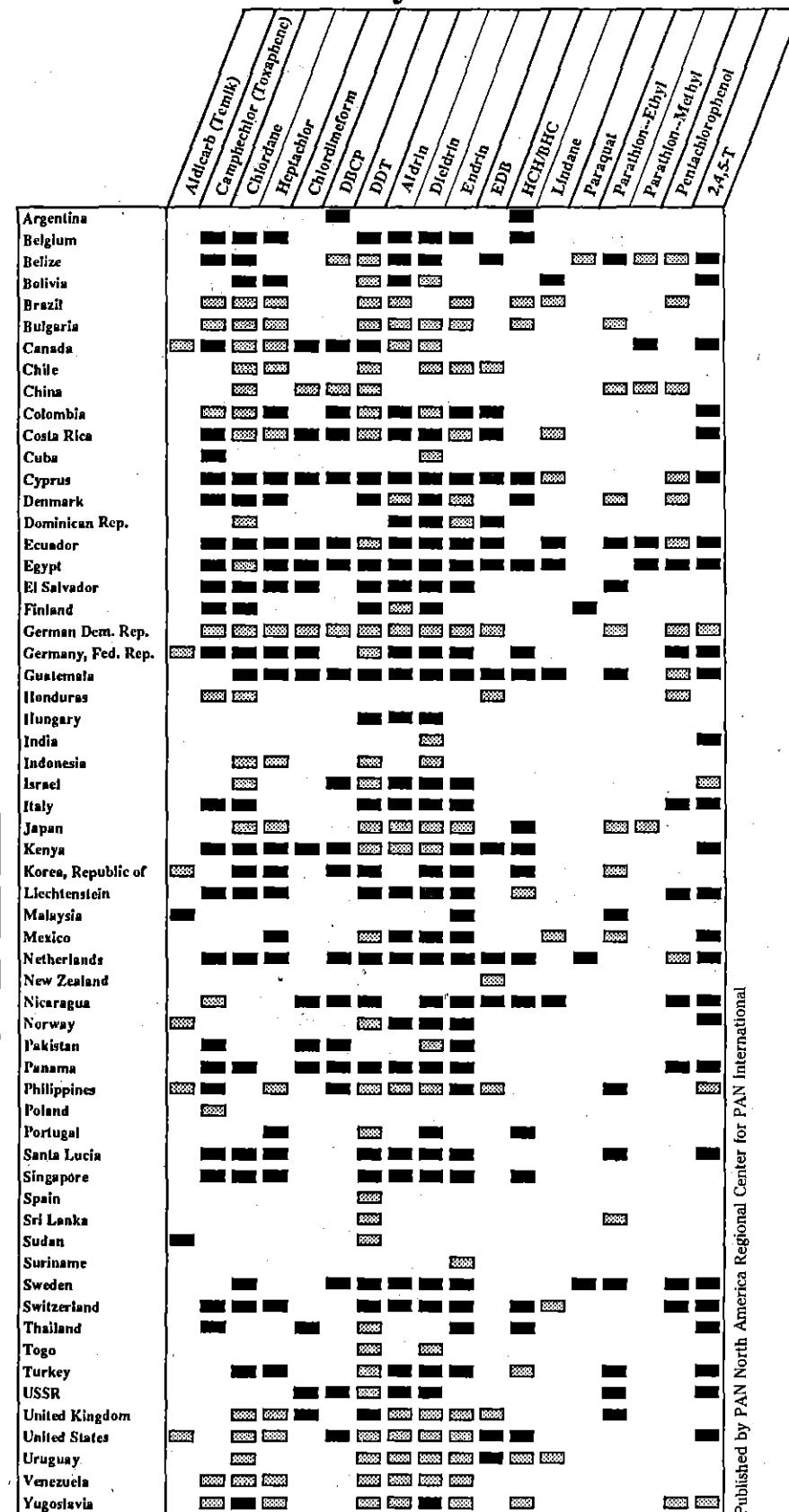
1. ensure that all policy decisions affecting pesticide trade and use place first priority on human safety and ecosystem integrity;

2. strengthen pesticide regulation and information systems in all countries and international agencies; and

3. generate support for sustainable agriculture and integrated pest management (IPM) throughout the world.

Effectiveness of the four-year-old Dirty Dozen campaign has been un-

The Demise of the Dirty Dozen



Published by PAN North America Regional Center for PAN International

even, says Kai Siedenburg, Campaign Coordinator. Much of the success results from what Siedenburg calls "dumping dynamics."

"Many developing countries are unwilling to appear as a dumping ground for pesticides, regardless of health or environmental concerns," she observes. They don't want an international reputation as being easily exploited.

Although PAN as an organization symbolizes the global momentum necessary for international pesticide reform, it is in reality a network of various groups and individuals throughout the world.

North American organizations contribute to international reform by taking independent initiatives, coordinating their efforts with PAN, and/or by having representatives on the PAN North America Steering Committee or Board of Directors.

PAN North America Regional Center; P.O. Box 610; San Francisco, CA 94101; (415) 541-9140; FAX: (415) 541-9253.



International Organization of Consumers Unions and Institute for Consumer Policy Research

Both the International Organization of Consumers Unions (IOCU) and the Institute for Consumer Policy Research (ICPR) serve as PAN NA Steering Committee members. ICPR is a division of Consumers Union USA, which is a member of IOCU. Therefore, activities of the two groups are closely aligned.

Escape from the Pesticide Treadmill: Alternatives to Pesticides in Developing Countries.² ICPR entomologist Michael Hansen has written this book, which documents six specific examples where integrated pest management (IPM) or nonchemical means of pest control have been used successfully/commercially on a large scale (see review, p. 49). The book is distributed internationally to illustrate that non-pesticide and least-pesticide approaches are being successfully implemented.

Work with PAN on Food and Agriculture Organization (FAO) Code of Conduct. With PAN, IOCU has worked to develop FAO voluntary international

guidelines for the marketing and advertisement of pesticides. (JPR 6(1):20-22).

After the Code was implemented, Hansen and Sarojini Rengam (of the IOCU regional office for Asia and the Pacific, located in Penang, Malaysia) documented the degree to which the Code was being implemented in Thailand, Malaysia and Indonesia. Their report, *Violating the Pesticide Code*,³ was presented at a 1987 FAO meeting as evidence the Code needs better surveillance.

Hansen has also testified before Congress, urging implementation of the Code into the U.S. Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

Work on the World Bank. After much pressure from IOCU, Consumers Union, and PAN, the World Bank in April 1985 issued guidelines that it would not fund the use of banned pesticides and would instead fund IPM programs (JPR 6(1):18-19).

Michael Hansen is preparing a report showing there is little evidence of World Bank policy implementation through 1988 (see p. 13).

Jean Halloran of ICPR says there is a lack of World Bank commitment to IPM guidelines because IPM is "messier" to fund than chemical pesticide programs. Money for IPM must be spread among more processes and people. She hopes the report by Hansen will force the Bank to be more self-critical.

United Nations Consolidated List.

PAN and IOCU worked internationally to get United Nations (UN) delegates to vote for the *Consolidated List of Products whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or Not Approved by Governments*,⁴ a product-by-product, 500-page list of pharmaceuticals, agricultural chemicals, industrial chemicals, and consumer products banned or severely restricted in countries throughout the world (see p. 7).

The *UN List* is a necessary tool for pesticide regulators in developing countries because often it is their only means for determining pesticide regulatory activity beyond their borders.

The UN publishes the list yearly, but it comes out in English, French, and Spanish every other year and in Arabic, Russian, and Chinese in alternate years. IOCU is lobbying the UN to publish the *UN List* in English every year, put it on a computer, and include unregistered pesticide and consumer products.

*A Consumer Guide to Biotech-

nology. Michael Hansen and Eileen Nic (IOCU) are preparing to write a consumer's guide to biotechnology that will include such topics as genetically engineered biological controls (JPR 9(1):18-21). The two authors plan to discuss the problems biotechnology poses for sustainable agriculture worldwide.

Letter to the United Nations Environment Programme. In May 1989, Eileen Nic wrote a letter to Dr. Mostafa Tolba, Executive Director of the UN Environment Programme (UNEP), calling for the initiation of several UNEP studies on sustainable agriculture and a joint UNEP-FAO conference on sustainable agriculture to be held before 1992.

International Organization of Consumers Unions; 825 West End Ave. #7D; New York, NY 10025; (212) 663-6378; FAX: (212) 749-3829.

Institute for Consumer Policy Research; 256 Washington Street; Mt. Vernon, NY 10553; (914) 667-2684.



Greenpeace USA

Greenpeace USA (PAN NA Steering Committee member) is a prominent actor in international pesticide reform efforts. Greenpeace formally launched its International Pesticide Campaign in 1987 after a series of incidents. The 1986 PAN International Conference in Ottawa was one spark encouraging Greenpeace to organize a global effort focused on pesticides. Greenpeace campaigner Jim Puckett, then based in Seattle, was compiling a database on producers of PAN's Dirty Dozen pesticides and was therefore already active on the international level. Beginning in 1986 Greenpeace was researching how multinational development banks affect development in southern countries.

Finally, a fire in New Zealand at an Imperial Chemical Inc. 2,4,5-T storage facility seriously injured several ill-equipped firefighters, including an active Greenpeace member. Having committed itself to an international pesticides campaign, Greenpeace has become active in numerous areas of

reform:

World Bank Pesticide Guidelines. With IOCU, Greenpeace has advised the World Bank on its compilation of guidelines for agricultural loans to southern countries. Although the guidelines were revised in 1985 to promote integrated pest management and stop funding for the use of banned pesticides, those guidelines have not been effectively implemented. Greenpeace is working informally with writers of the guidelines to ensure inclusion of a process for implementation and evaluation of the revised guidelines, which will be finalized and issued in 1989.

Peruvian Coca Eradication. Greenpeace has disclosed and publicly opposed the U.S. State Department's plan to eradicate coca in Peru using tebuthiuron (Spike) (JPR 8(3):37). Herbicide manufacturer Eli Lilly refused to sell tebuthiuron to the State Department presumably because the herbicide would be applied near aquatic environments in Peru and would drain into the Amazon River; tebuthiuron was developed for use on rangeland. At one point, the U.S. government tried to buy the herbicide's patent and have a different manufacturer produce it. A 25-hectare test plot has been sprayed with Spike, and the government theoretically is monitoring environmental impacts and will release results at the end of 1989. Greenpeace intends to continue to keep the public informed of and involved in the coca eradication plans.

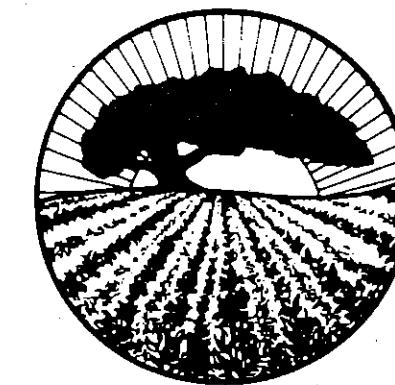
Sandra Marquardt (Greenpeace pesticide information coordinator) has met with the Senate Environment and Public Works Committee, the Senate Foreign Relations Committee, the House Appropriations Committee, and Peruvian environmentalist Carlos Aranda to discuss the coca eradication issue.

Velsicol. Marquardt published an article in *Greenpeace Magazine* asking citizens to write the Environmental Protection Agency and Velsicol opposing Velsicol's production of heptachlor and chlordane for export only. Marquardt has tracked the re-entry of heptachlor into the United States on imported beef in 1988 and the presence of both heptachlor and chlordane in human breast milk and in the fatty tissues of animals around the world. The deluge of letters stimulated by Marquardt's call for action has created congressional interest in the fact that

FIFRA, the national pesticide law, allows export of pesticides banned as too dangerous in the United States.

Greenpeace USA; 1436 U Street, NW; Washington, D.C. 20009; (202) 462-1177; FAX (202) 462-4507.

Greenpeace Pacific SW; Fort Mason, Bldg. E; San Francisco, CA 94123; (415) 477-6767; FAX: (415) 474-4269.



International Alliance for Sustainable Agriculture

The Minnesota-based International Alliance for Sustainable Agriculture (IASA), a member of the PAN NA Steering Committee, has released several publications in support of international pesticide reform.

Breaking the Pesticide Habit: Alternatives to 12 Hazardous Pesticides.⁵ With support from the Ford Foundation and the Canadian International Development Agency, a 1989 edition of this 1987 book by IASA Executive Director Terry Gips will tentatively be published and distributed by IOCU. The book will be free to southern country gorups. Work has begun on a French version, and funding is being sought for Spanish and Arabic versions.

***Planting the Future: A Resource Guide to Sustainable Agriculture in the Third World.** In this book, Meera Nanda of IASA presents farming practices, resources, and activities of more than 100 Third World groups. Publication is scheduled for 1989, and regular revisions are planned. Any southern country group wishing to be included in the next edition should complete a questionnaire available from IASA. They will receive a free copy of the book.

Planting the Future Award and Sustainable Agriculture Development Grants. With funding from Skiers Ending Hunger, IASA plans to select groups for its "Planting the

Future" Award and Sustainable Agriculture Development Grants. The Planting the Future Award will be offered to a group that exemplifies sustainable agriculture in the Third World. A \$2,500 cash prize and a visit with colleagues in the United States will accompany the award. Grants will be awarded to selected groups to support their efforts on behalf of sustainable agriculture and alternatives to pesticides.

Spiders and Sustainable Agriculture. This IASA book planned for publication in fall 1989 describes the role of spiders in sustainable agriculture and the adverse impact of pesticides on spiders. The book attempts to overcome people's fears and misconceptions regarding spiders.

International Alliance for Sustainable Agriculture; 1701 University Ave., SE; Minneapolis, MN 55414; (612) 331-1099 (also FAX).



Northwest Coalition for Alternatives to Pesticides

The Northwest Coalition for Alternatives to Pesticides (NCAP), a member of the PAN NA Steering Committee, has recently been involved in pesticide reform efforts in Australia. In April 1988, while visiting Australia, *Journal of Pesticide Reform* editor Mary O'Brien worked with Adelaide attorney Brian Baillie to reveal hazards of an aldrin spill in a Streaky Bay (Western Australia) elementary school and inadequacies of a state report on the spill and subsequent so-called "decontamination." Extensive media coverage addressed the issue.

In November 1988, University of Oregon environmental law professors Michael Axline and John Bonine happened on plans in Tasmania to build the world's largest chlorine-based pulp mill (JPR 9(1):12-17). The professors used a fax machine to obtain information from Carol Van Strum of Oregon regarding dioxins that would be produced by the mill. Bonine and Axline held a press conference in Australia outlining the dangers dioxins pose.

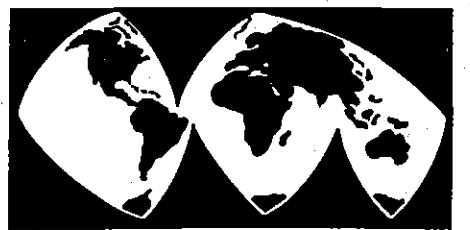
O'Brien later flew to Tasmania to hold press conferences and reveal in detail dioxin and other organochlorine problems posed by the huge pulp mill.

Because of a major Tasmanian effort and global support, mill plans were defeated.

In March 1989, O'Brien wrote three affidavits for an Australian case in which citizens were challenging the decision of a New South Wales Shire Council to spray 2,4-D rather than rely on the groundsel bush gall fly to control groundsel bush in pastures. The affidavits detailed 1) North American 2,4-D incidents and examples of public agency elimination of 2,4-D; 2) environmental and health problems associated with 2,4-D; and 3) responses to an Australian toxicologist's affidavit supporting 2,4-D use.

In May 1989, O'Brien provided information to citizens and spoke on Western Australia public radio regarding herbicides planned for use in massive Western Australia aerial spraying over forestry clearcuts.

Northwest Coalition for Alternatives to Pesticides; P.O. Box 1393; Eugene, OR 97440; (503) 344-5044.



Rural Advancement Fund International

Rural Advancement Fund International (RAFI) focuses on the socioeconomic impact of new technologies on rural societies. It monitors industries engaged in biotechnological research and publishes listings of chemical/pesticide manufacturers, their products, and the targets of their products.

RAFI also disseminates "backgrounders," which outline such topics as herbicide resistance and conservation of traditional seed/plant genetic varieties in southern countries (JPR 9(1):18-21). The publications are in English, but translation into all languages is encouraged.

Rural Advancement Fund International (USA); P.O. Box 1029; Pittsboro, NC 27312; (919) 542-5292.

ENVIRONMENTAL POLICY INSTITUTE Environmental Policy Institute

Jack Doyle of the Environmental

Policy Institute (EPI) has written *Altered Harvest*,⁶ a book that cautions about the agricultural implications of biotechnology. For example, multinational companies are developing ways to make plants herbicide resistant (JPR 6(2):26-31).

If plants are genetically engineered so herbicides do them no harm, farmers will not worry about damage to their crops, and chemical manufacturers will be able to sell more herbicides. Herbicides, however, will continue to build up in soil, flow into surface water, and leach into groundwater.

Doyle lectures abroad in countries such as Denmark to discuss problems associated with pesticides and biotechnology.

Environmental Policy Institute; 218 D Street, SE, Washington, D.C. 20003; (202) 544-2600; FAX (202) 543-4710.



National Coalition to Stop Food Irradiation

The National Coalition to Stop Food Irradiation (NCSI) works in conjunction with Food Irradiation Network International (FINI). In December 1988, NCSI sent three people to an International Atomic Energy meeting in Geneva, where they lobbied against acceptance and control of food irradiation practices.

In April 1989, Codex Alimentarius, a UN committee that sets international standards on all kinds of food labeling, met to weaken food irradiation labeling standards that were set in 1985. NCSI lobbied United States delegates to uphold the international standards, which are stricter than those in the United States. The stricter standards were upheld.

National Coalition to Stop Food Irradiation; P.O. Box 59-0488; San Francisco, CA 94159; (415) 626-2734.

The Technology of International Pesticide Reform

PAN provides momentum for international pesticide reform, but the network's existence depends on the free flow of ideas and information throughout the world among numerous groups

and individuals such as those coordinating their efforts and acting independently in North America.

Until recently, multinational pesticide manufacturers have utilized twentieth century technology to dominate the world with their chemical methods of pest control. Reform activists, however, are using their own technology. It is called networking, and it combines age-old forms of communication such as letters and books with newly developed modes of communication such as the computer database and fax machine.

A pesticide manufacturer might say the effectiveness of a pesticide depends on a creative combination of particular chemicals. The effectiveness of international pesticide reform depends on a creative combination of people with information on sustainable resource management, sustained by numerous modes of communication.

Information as Power: The United Nations' Consolidated List of Hazardous Products

By Eileen Nic

A directory published by the United Nations (UN) and known as *The Consolidated List of Products Whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or Not Approved by Governments* is a first step in the direction of resolving some of the life-threatening problems caused by the largely unregulated international trade in banned and restricted products.

The *Consolidated List* (sometimes called the UN Directory), a 700-page document, contains critical information on regulatory decisions, restrictions and bans taken by national governments on harmful pesticides, dangerous pharmaceuticals, hazardous consumer products and toxic industrial chemicals. Seventy-seven countries currently contribute data.

The directory is the outcome of years of concern within the United Nations about unrestrained trade in products that are, for health and safety reasons, strictly regulated or even prohibited in some countries. In 1982, responding to public interest pressure from the Coordinating Committee on Toxics and Drugs, International Organization of Consumers Unions (IOCU), Pesticide Action Network (PAN), and other non-governmental organizations (NGOs), the United Nations General Assembly

adopted a resolution calling for the preparation of a directory listing the hazardous products and describing in plain language regulatory action that had been taken on them.

A Most Useful List

The UN Directory serves both governments and citizen groups. It gives governments that lack regulations on hazardous products a data base to develop policies on import and use. It also provides a strong impetus for reexamining existing policies that had often been formulated with insufficient information.

"[Citizen] groups have used the Consolidated List to compare their own country's regulatory position on a particular product with the positions taken by other governments."

The UN Directory is, as well, a critical information source and a powerful rallying point and organizing tool for citizen groups worldwide. Groups have used the Consolidated List to compare their own country's regulatory position on a particular product with the positions taken by other governments.

The Citizens Alliance for Consumer Protection in Seoul, Korea, for instance, used it in 1986 to prepare a detailed study of which prohibited pharmaceutical products found in the UN Directory are available to Korean consumers. They found that of 178 products listed as withdrawn in some other countries, 29 were freely available in their country. When confronted with this information, the Ministry of Health initially denied that the UN Directory even existed. The Korean press picked

up the issue and the government finally found its copy of the UN document.

As a result, the consumer group now has greater attention from the government. The organization is using its study and its improved relationship with the government to change pharmaceutical policy in Korea. The same group completed a similar study on pesticides in 1987 with equally good results.

• In Mauritius, in 1986, the Association de Consommateurs de l'Ile de Maurice (ACIM) a citizen group, did a study with the UN Directory similar to the Korean one. As a result, in 1988 the government set up a new committee to review pesticide legislation. It is called the "ACIM Committee." According to Jayem Chellum, author of the report, "Releasing the study was the equivalent of dropping a bomb on the regulatory authorities."

• In Sri Lanka, the United Nations Association, a public interest citizen group, is undertaking a massive public education campaign on the issue of 'dumping' of hazardous products. Using the UN Directory as an example of double and triple standards in product regulation, they are working with the media, in schools, and with community organizations to raise questions about the use of hazardous chemical products.

• In Quito, Ecuador, Fundacion Natura, an environmental organization, used the UN Directory to convince its government to ban or severely restrict 23 hazardous pesticides—one of the highlights of a ten-year campaign to make the public aware of dangers posed by hazardous agricultural chemicals. The group also prompted their Minister of Agriculture to inform the UN of his decision and to write a personal letter in support of the Directory.

• In the United Kingdom, a London environmental organization used the UN Directory as a critical part of its testimony to support positive,



every two years. Ask that the Consolidated List be computerized and made available on computer disk so that data can be added to it on an ongoing basis and not just when a new printed edition is due.

- Check the directory as soon as you get it to see that data pertaining to regulations in your country are both complete and accurate.

- Inquire at your health, environment and agriculture departments to see if they have copies. If you find that they do not yet have a copy, write to the United Nations address above, indicating the names and addresses of officials who need one.

- Ask your government to send complete and accurate information on banned products for the 1989 edition of the Consolidated List.

- Send official information on bans and restrictions in your country directly to the UN New York office, whose address is listed above. The UN will verify the data with your government and should include it in the next edition.

"Ask that the Consolidated List be computerized and made available on computer disk so that data can be added to it on an ongoing basis and not just when a new printed edition is due."

consumer-oriented changes in the Food and Environment Protection Act.

• Health Action International-Pakistan did research in 1987 based on the UN Directory to determine the availability in Pakistan of banned pharmaceutical products. They found that 64 products covering some 175 brand names manufactured or marketed by about 100 firms are available freely in that country although banned or severely restricted elsewhere. The group demanded that the authorities take immediate action "to weed out all ineffective, useless and dangerous drugs." The Ministry of Health is currently reviewing the pharmaceutical policy.

Who Opposes the List?

Most likely because its potential as a vehicle for change was recognized early on, the first edition of the UN Directory triggered stiff opposition from some industrialized countries and the corporate sector. Three times in four years the United States has voted "no" on United Nations General Assembly resolutions that supported the directory

project. Despite much opposition, health, environmental, women's, religious, worker, and consumer groups have provided critical support nationally and internationally.

Just as public interest groups and individuals provided the impetus and support for the original resolution to produce the *Consolidated List*, public pressure is necessary to make sure that the directory not only survives, but improves with future editions. It is also critical that it be updated more frequently so that citizens can depend on it and use it to effect change.

What Needs to Be Done

- Order a copy of the Consolidated List for your organization to use. You can get one by writing to: Mr. Rafeeudd

Ahmed; Under Secretary General for International Economic and Social Affairs; 2 United Nations Plaza; New York, NY 10017; USA. Ask for a copy of the Consolidated List.

When you write your letter, it is important to mention that the Directory *should be published in English every year*—now it appears in English only

- Send letters from your organization indicating your support of the *United Nations Consolidated List of Banned and Severely Restricted Products*. Letters should be sent to the following:

Mr. Rafeeuddin Ahmed
Under Secretary General for International Economic and Social Affairs
2 United Nations Plaza
New York, NY 10017
USA

Mrs. Inger Brugemann
Director of External Coordination

World Health Organization
20 Avenue Appia
1211 Geneva 27
Switzerland

Mr. Jan Huismans
Director
IRPTC/UNEP
Palais des Nations
1211 Geneva 10
Switzerland

- Ask your government officials how they use the directory. If they mention that any regulations have been taken as a result of the directory, let us and the UN know about it.

- Compare the data in the UN list to

regulations in your country and write up a report on it. Many groups have done this with very positive results.

- Send, if possible, a copy of any letter and all information that you mail to the United Nations to:

Eileen Nic
Coordinating Committee on Toxics and Drugs
825 West End Ave., Suite 7D
New York, NY 10025
USA

And to:

Martin Abraham
Consumer Interpol

Paraquat (dichloride)

Product name
C.A.S. number 1910-42-5

Scientific and common names, and synonyms

BIPYRIDINUM, 1,1'-DIMETHYL-4,4'-DICHLORIDE
N,N'-DIMETHYL-4,4'-BIPYRIDINUM DICHLORIDE
N,N'-DIMETHYL-4,4'-BIPYRIDYLUM DICHLORIDE
N,N'-DIMETHYL-4,4'-DIPYRIDYLUM DICHLORIDE
1,1'-DIMETHYL-4,4'-BIPYRIDYNUM DICHLORIDE
1,1'-DIMETHYL-4,4'-DIPYRIDYLUM CHLORIDE
4,4' DIMETHYLDIPYRIDYL DICHLORIDE

Legislative or regulative action:

Country*	Effective Date	Description of action taken grounds for decision
FIN	30 Aug. 1986	Use banned because of high acute toxicity. (Reference: (FIPBD) Pesticide Board, 24 Apr. 1985).
HUN	1985	The active agent is permitted only if it contains an emetic and is colored blue.
ISR	1963	Due to the compound's high acute mammalian toxicity, it is subject to special labeling requirements, and formulations are required to contain an emetic and a distinguishing color.
NOR	1981	The product has been voluntarily withdrawn from the market.
NZL	1983	Under the Toxic Substances Act, liquid preparations and solid preparations containing 5% or more of this product are restricted to commercial users and are labelled "dangerous poison." Other solid preparations are labelled "poison." Under the provisions of the Pesticides Regulations (1983) a "suitable" emetic and stenching agent must be added to this product.
PRT		This product may not be marketed in Portugal on account of its environmental/toxicological effect. (Applies to mixtures of paraquat and simazine.) (Reference: (PORTP) Comissao de Toxicologia dos Pesticidas.)
SWE	31 Dec. 1983	Banned because of its high acute toxicity and irreversible effects. (Reference: (PKB) Produktkontrollnaemndens Beslut fraan Den., 31 Dec. 1983.)

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FAO PLANT PRODUCTION & PROTECTION PAPER, 46, 1982
FAO PLANT PRODUCTION & PROTECTION PAPER, 49 SUP., 1982
IPCS ENVIRONMENTAL HEALTH CRITERIA, 39, 1983

*Countries listed for paraquat: Finland, Hungary, Israel, Norway, New Zealand, Portugal, Sweden.

Excerpt from United Nations. 1989. *Consolidated List of Products Whose Consumption And/Or Sale Have Been Banned, Withdrawn, Severely Restricted or Not Approved By Governments*. Third Issue.

IOCU
P.O. Box 1045
10830 Penang, Malaysia

This is very important because it will help us keep track of citizen support, which is crucial to the continuation of the effort.

• Send a copy of this article to citizens whom you know or NGOs with whom you are familiar in other countries. Urge them to order a copy of *The Consolidated List of Products Whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or Not Approved by Governments*.

The information is a powerful tool for change. ■

Where in the World Shall We Send Our Hazardous Waste Today?

By Mary Deery Uva

Where do the chemical wastes generated during pesticide manufacture go? When we "dispose" of unused pesticides, where do they go? When seen apart from their targeted "pests," pesticides and their byproducts are, simply, "toxic and hazardous wastes," and such wastes increasingly get dumped somewhere outside our borders. "Out of sight" for North Americans must not mean "into other countries." —Ed.

In August 1986, a Bahamian-registered cargo ship named the *Khian Sea* left Philadelphia carrying 15,000 tons of the city's municipal incinerator ash. Headed for the coast of Panama, the shipment was the first delivery in a plan to ultimately dump 250,000 tons of toxic ash in a roadbed for a Panamanian tourist resort. At \$40 per ton, half the cost of disposal at home, the deal would have been a bargain for Philadelphia taxpayers and the private contractor hired to get rid of the city's incinerator residues. But at the last minute, it was revealed that the planned road cut through ecologically fragile wetlands, which would have been gravely threatened by the toxic ash. The Panamanian government halted the shipment and cancelled the deal.

Thus began the saga of the *Khian Sea*. In vain attempts to dump its toxic cargo, the ship spent the next two years wandering from country to country, eventually visiting five different continents. At one point some 3,000 tons of its load were illegally dumped on a beach in Haiti, but the *Khian Sea* never found a receptive port for the rest of the ash. In late 1988, Philadelphia's incinerator ash disappeared in the Indian Ocean.

Bargain Dump Sites in Other Countries

Until the early 1980's, this ash, like most wastes, would have been dumped into landfills in the United States. However, under 1984 amendments to the Resource Conservation and Recovery Act (RCRA), the Environmental Protection Agency (EPA) tightened requirements for safer management and disposal of municipal and untreated hazardous wastes. These new laws have made it much more expensive for waste generators to get rid of their wastes. For the 300 million tons of hazardous waste generated in the United States each year, average disposal costs jumped from around \$15 per ton in 1980 to over \$200 per ton in 1987.¹ Solid waste disposal costs are also escalating, especially in regions with limited landfill capacity; for example, solid waste disposal costs in New Jersey jumped by 247% from 1986 to 1987.

Instead of working to reduce the volume and toxicity of solid and industrial wastes, a growing number of [waste-generating] industrial countries are trying to avoid the high costs of safe disposal by dumping their wastes at bargain rates in developing countries.

ing their wastes at bargain rates in developing countries.

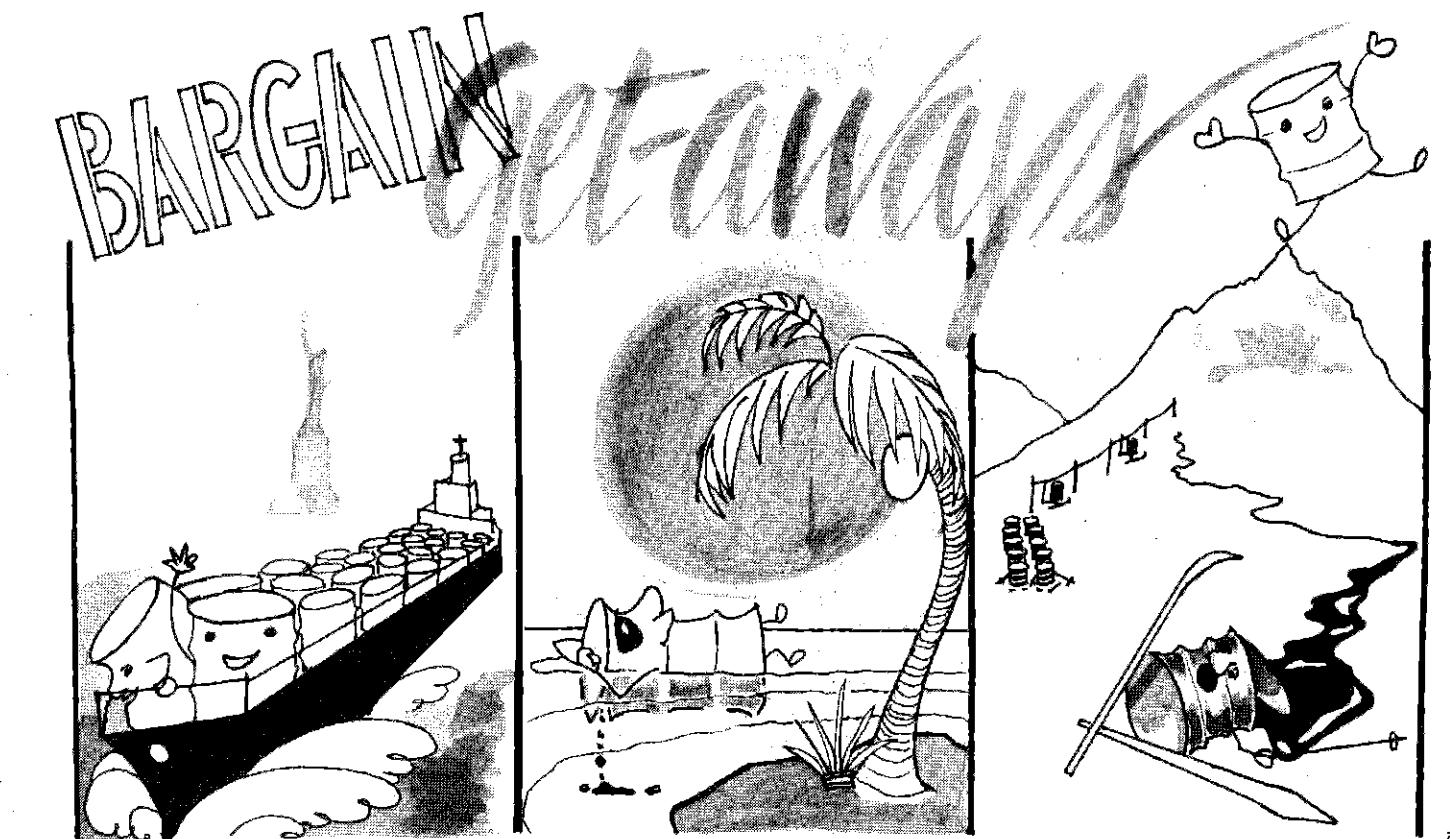
Greenpeace International has been monitoring this global trade and reports that since 1986 the United States and Europe have shipped hazardous waste to at least eleven developing countries including Brazil, Haiti, Lebanon, Mexico, Nigeria, South Africa, Syria, Venezuela, and Zimbabwe.² At least thirty-eight other countries have been proposed for waste trade schemes.

Forty Countries Say No

Other countries have also been embarrassed by wandering waste ships like the *Khian Sea*. In one incident last year, an Italian business person caused an international scandal for Italy by dumping 2,100 tons of PCB-contaminated waste in Koko, Nigeria. Italy retrieved the waste after the outraged Nigerian government recalled its ambassador from Rome, but then rankled the entire European Community as the waste ship, the *Karin B.*, tried to dump the waste in Great Britain, France, Spain, West Germany, and the Netherlands before finally returning to Italy.

Most developing countries have neither the technical capability nor the regulatory infrastructure to ensure safe handling and destruction of toxic waste. Instead, waste exports to these countries will most likely be dumped into the environment to recreate the environmental nightmares already faced in industrialized countries. Recognizing this, citizens in many developing countries are vehemently demanding an international ban on what they have called "toxic terrorism."

The Organization for African Unity has publicly condemned dumping in Africa as "a crime against Africa and the African people" and asked its member countries to ban all waste imports. Over forty countries throughout the world have already banned waste imports and instituted criminal penalties for hazardous waste importers. In Nigeria the mandatory penalty for any persons convicted of illegal waste



.. A WORLD CRUISE .. A HIDDEN TROPICAL BEACH... CANADA!!!

dumping is life imprisonment.

The United Nations Legitimizes Hazardous Waste Deliveries

In an effort to curb waste dumping in developing countries, the United Nations Environmental Program (UNEP) recently sponsored an international convention to control transboundary movements of hazardous wastes which was signed in March of this year. During the negotiations, many developing countries appealed to UNEP for a global ban, and early drafts of the convention did contain strong mechanisms to discourage and in some cases ban international waste dumping. However, the United States was primarily responsible for stripping the final version of any substantive mechanisms to curtail the growing international trade.

Representatives of the Bush Administration at the negotiation sessions successfully labored *against* banning the international trade of hazardous waste, *against* controlling the international transport of radioactive waste, *against* establishing minimum international waste management standards, *against* requirements to inform nations in ad-

vance if hazardous wastes will be shipped through their territorial waters, and *against* a prohibition on states with stricter environmental standards from shipping hazardous wastes to states with less developed regulations.

As a result, the UNEP convention essentially legitimizes the international trade in hazardous wastes by an international "prior informed consent" (PIC) program very similar to the existing program for United States waste exports administered by EPA.

EPA: This is What Prior Informed Consent Means?

EPA permits hazardous waste to be legally exported from the United States to any country in the world through PIC notification. Although the intent of the program is to give receiving countries the opportunity to reject unwanted waste shipments, EPA has not enforced the program to ensure even this protection.

In a recent audit of the program, the Inspector General of EPA described general confusion within the agency and among exporters about the program requirements, and concluded that "hundreds of tons of exported hazard-

ous waste ... were not handled in accordance with the Agency's regulations. ..." EPA has knowingly approved export notifications containing incomplete or false information, including false "recycling" schemes in which "recyclable" exports simply have been dumped in the receiving country. EPA on occasion failed to inform companies about exports that were denied by receiving countries, as was the case for 61 waste shipments denied by Canada between December 1986 and May 1987. EPA had not set up even a basic monitoring or enforcement program with the U.S. Customs Service to catch illegal shipments leaving U.S. borders, allowing exporters to make illegal shipments with little chance of detection.

The number of waste export notifications to EPA under this program have increased dramatically, from 12 in all of 1980 to 522 in just the first six months of 1988. Many of these exports have been approved by EPA and the receiving countries, allowing millions of tons of spent chemicals, solvents, acids, furnace dust, sludge, used batteries, and other hazardous wastes to be legally exported from the United States. Be-

Mary Deery Uva is a Science Associate at Natural Resources Defense Council.

Natural Resources Defense Council; 40 W. 20th; New York, NY 1001; (212) 727-2700.

tween 75-90% of American hazardous waste exports currently go to Canada, but from January 1987 through June 1988 EPA approved the export of 3.7 million tons to thirteen other countries in Europe, western Africa, Central and South America, the South Pacific, and the Pacific Rim.

EPA will authorize shipments even if the receiving country does not have the capability to safely handle the wastes. This provides incentive for private companies to arrange deals directly with corrupt officials in targeted countries *before* notifying EPA about exports. American waste management companies have already approached the Philippines, Honduras, the tiny South Pacific island of Tonga, and other countries with proposals for landfills, toxic waste incinerators, and other schemes for wastes imported from the United States. Although most of these deals have fallen through so far, companies continue to lobby receiving countries to approve waste shipments.

Loopholes Big Enough for Barges

Some types of waste are not covered by the PIC programs, and can be exported freely without notifying the receiving country simply because they are not officially categorized as "hazardous" by EPA. Municipal incinerator ash, household trash, infectious wastes, and raw sewage sludge, all of which may be toxic or unsafe, can be exported without any regulatory oversight. Long Island's "garbage barge" and Philadelphia's incinerator ash saga are the most notorious examples in which American entrepreneurs have tried to dodge the solid waste crisis by exploiting this loophole.

"Municipal incinerator ash, household trash, infectious wastes, and raw sewage sludge... can be exported without any regulatory oversight."

Considering the failure of the U.S. PIC program, the UNEP convention does not offer any hope that effective en-

forcement of an international program based on the same export control system will be possible. As a result, only thirty countries signed the convention, and many developing countries refused on the grounds that the treaty does not offer any real protection from unwanted waste imports.

What Is Needed?

Congressional legislation by Senator Robert Kasten of Wisconsin, Representative John Conyers of Michigan, and others is under consideration and, with some tightening, could deter American waste generators from exporting pollution from the United States.

"Ultimately the United States should hold all waste generators fully accountable and financially liable for the safe disposal of their wastes in all countries affected by the shipment of wastes."

However, new legislation will be successful only if the underlying principle is to ban *all* waste exports unless it can be certified that the generation of the wastes could not have been avoided or minimized *and* that the wastes will be treated in a manner *more* environmentally protective than in the United States.

The definition of wastes for export would have to be expanded beyond officially categorized "hazardous" wastes to cover all waste streams including incinerator residues, infectious wastes, recyclable materials, sewage sludge, and radioactive wastes.

If waste exports are transported through territories and waterways of other countries, those transit countries have the right to be informed to protect their populations and to prepare for any potential accidents, and must be notified and provide consent for the shipment. It must also be certified that citizens of the municipalities to be affected by the waste exports are notified and afforded the right to a public hearing on the action, the same right af-

fedor to American citizens potentially affected by the disposal of wastes. Ultimately, the United States should hold all waste generators fully accountable and financially liable for the safe disposal of their wastes in all countries affected by the shipment of wastes.

The Best: Just Say No

Perhaps the most important development in this debate is that non-governmental organizations (NGOs) are exercising a strong voice to halt the international dumping of hazardous wastes. Environmental and consumer activists from the African Network of Environmental NGOs (ANEN), the Environmental Liaison Centre International, Greenpeace, the International Organization of Consumers Unions (IOCU), and the Natural Resources Defense Council (NRDC) were among the first to flag the growing hazardous waste trade, and have effectively halted a number of illicit export deals with developing countries.

"Perhaps the most important development is that NGOs are exercising a strong voice to halt the international dumping of hazardous wastes."

Greenpeace International maintains an up-to-date database on current and proposed waste export schemes, and with ANEN, ELC, IOCU and NRDC, has organized the International Toxic Waste Action Network, for monitoring the international trade and taking global action against the dumping of toxic wastes in southern countries. ■

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The World Bank and Pesticides: Guidelines and Reality

By Michael Hansen

The World Bank is the world's largest and perhaps most important development agency. In 1988 alone, it approved over \$19 billion in loans to 97 Third World countries. Of this amount, almost \$4.5 billion, or more than 20 percent, was allocated to 56 projects in Agriculture and Rural Development (one of thirteen sectors, or categories of projects, financed by Bank loans). It is clear that the World Bank is in a position to profoundly affect agricultural policy and practice in the countries to which it grants loans. It also stands in a unique position to help remedy Third World pesticide problems.

History

The World Bank or, as it is frequently called, The World Bank Group, is actually composed of three entities: The International Bank for Reconstruction and Development (IBRD), the International Finance Corporation (IFC), and the International Development Association (IDA).

Formed in 1944, the IBRD and the International Monetary Fund (IMF) were initially designed to help rebuild the economies of nations devastated by World War II. They were used to influence development in member countries. While both provide loans to member countries, the IMF focuses on short-term economic relief; the IBRD focuses on longer-term investment in enterprises or endeavors that foster "development."

The IFC was created in 1956 to provide loans directly to private corpora-

tions for development purposes, in order to avoid having the host country inspect the private corporation's books. The IDA was set up in 1960 to address a very different problem: how to provide loans to countries needing them the most yet having the least access to them.

The IDA grants "credits," which are essentially long term loans on which no interest is charged.

Agricultural... and Pesticide Loans Increase

In the early days of the Bank, agricultural projects did not have a high priority, accounting for only 8.5 percent of the Bank's total lending between 1948-1963. During Robert McNamara's presidency (1968-1982), loans for agricultural projects increased dramatically. As of fiscal year 1987, 19.9 percent of money loaned through IBRD and 35 percent of the "credits" allocated through IDA went to agriculture and rural development projects.

"Throughout its history, projects supported by the Bank have generally reflected a predominant view that Third World development should be modeled on northern industrial development."

Throughout its history, however, projects supported by the Bank have generally reflected a predominant view that Third World development should be modeled on northern industrial development. For agricultural projects, this usually meant trying to transfer technology initially developed for industrialized nations to developing countries, even though the former practice temperate zone agriculture and the latter lie in the tropics. Temper-

ate agriculture tends to be both capital and chemical intensive: it is highly mechanized and makes heavy use of new high yielding seeds, chemical fertilizers, and pesticides. The policy makers, scientists, and technicians developing and implementing technological packages "for the developing country" farmer all tended to share the assumption that their job was to lead the way in transforming traditional agriculture (considered low-yielding and primitive) into modern, "progressive" (i.e., industrial) agriculture.

This approach to agriculture failed to take cognizance of the fact that tropical agro-ecosystems are fundamentally different from temperate agro-ecosystems and that, in particular, the chemical approach to pest control so frequently used in temperate zone agriculture is far less effective in tropical zone agriculture. The Bank's approach also failed to recognize the difficulty of insuring safe pesticide use in the tropics, as well as failing to take into account social and cultural differences. During the 1960s, 1970s, and early 1980s, the Bank came under increasing fire from environmentalists, who claimed that the Bank-sponsored projects, particularly the large scale ones, often created huge environmental problems. There was also concern over pesticide use in agricultural development projects.

A Changing World Bank

The Bank has slowly begun to respond to the environmental criticism. In 1970, it became the first multilateral or bilateral development agency to set up the post of Environmental Advisor. In 1973, it formed the Office of Environmental Affairs (subsequently called the Office of Environmental and Scientific Affairs [OESA]). In May 1984, the Bank published a new set of environmental policies and made them part of the Bank Operations Manual (a set of internal regulations given to all staff members).

During this same period, concern about pesticide problems, particularly in Third World countries increased. The

publication of *Circle of Poison*¹ in 1981, *A Growing Problem*² in 1982, and the formation of the Pesticide Action Network (PAN) in 1982 all served to draw international attention to the problem. In September 1984, over 200 non-governmental organizations (NGOs) throughout the world petitioned the Bank to reform its policies or take steps to address pesticide abuses occurring in Third World Bank-supported projects (JPR 6(1):18-19). The petition included specific suggestions as to steps the Bank could take to provide protection against pesticide abuses.

In response to the petition and to internal concerns over their environmental policy, the World Bank held a press conference on April 1, 1985, at which they released "*Guidelines for the selection and use of pesticides in Bank-financed projects and their procurement when financed by the Bank*." This document is commonly known as the World Bank's Pesticide Guidelines.

Pesticide Guidelines

The Pesticide Guidelines represented quite a departure from the Bank's previous policies. They explicitly recognized that the chemical approach to pest control does not work and proclaimed that integrated pest management would be the Bank's objective. As

"The Pesticide Guidelines . . . recognized that the chemical approach to pest control does not work and proclaimed that integrated pest management would be the Bank's objective."

the Bank noted in the Guidelines, "It is becoming increasingly evident that the unilateral chemical approach, in addition to posing potential threats to human health and to the environment, does not lead to sustainable and profitable agricultural production . . . Sound pest management should aim to reduce dependence on chemical pesticides . . . The Integrated Pest Management (IPM) approach, which includes the prudent use of pesticides when

damage reaches unacceptable levels, should be the objective of Bank strategy in agricultural development.³

According to the press release that accompanied them, "The guidelines include 22 operational requirements that must be observed by World Bank staff in designing and implementing development projects financed by the Bank. The requirements fall into four broad categories: a) pest and pesticide management practices; b) handling, storage and application of pesticides; c) selection of pesticide materials and formulation; and d) procurement of pesticides."⁴ The Bank subsequently issued two technical notes, designed to help Bank staff carry out the Guidelines.

In early 1987, the Institute for Consumer Policy Research began a project to monitor the Guidelines to determine whether and how they were implemented in practice. We looked at 24 projects with pest control components, funded between April 1985 and early 1988. Nine were studied in some detail and 15 in a much more cursory fashion.

During this time the Bank funded 193 agricultural and rural development projects. While our sample is not exhaustive, we think it is representative. For the main part of our analysis, we focused on the Staff Appraisal Reports (SARs), the operative documents which the Bank uses to decide whether or not to provide a loan for a project, and the basic documents in which the terms and purposes of a loan are specified. In addition, we talked to a number of Bank staff, as well as examined a number of internal World Bank documents on environmental policy and development, including an internal 1987 memo evaluating implementation of the Guidelines.

Does the World Bank Follow Its Guidelines?

In general, we found few signs that the Bank was aggressively trying to implement its Pesticides Guidelines. Even though the Bank press release announcing the Guidelines stated that "the guidelines include 22 operational requirements that must be observed by World Bank staff in designing and implementing development projects financed by the Bank" (emphasis ours), it was clear from an analysis of the SARs that there was no large-scale systematic attempt to observe and/or implement the Guidelines. Rather than being compulsory, implementation of the

Guidelines appears to have been highly optional, in part due to the inadequate level of staffing (they hired just a single person to coordinate and oversee implementation). Also, being guidelines, the language is all in the conditional (i.e., such and such *should* be done, rather than such and such *must* be done).

Another criticism has to do with the basic thrust of the projects. We need to remember that, ultimately, the Bank is in the business of making loans which need to be repaid. This influences the kind of projects that it funds, and seems to bias the Bank toward encouraging pesticide use. In the case of agricultural loans, the Bank has seen the straightest road to loan repayment to be to increase agricultural production and to make farmers more market oriented.

"Rather than being compulsory, implementation of the Guidelines appears to have been highly optional . . ."

Rather than stress self-sufficiency in basic food production, the projects encourage farmers to focus on cash crops, either for the domestic or foreign markets, and to increase crop production through the use of "technical packages." The agricultural systems promoted through these "technical packages" are invariably highly input intensive, using improved seed, lots of chemicals, irrigation and often machinery. The inputs are relatively expensive and the farmer has to pay for the bulk of them. But the idea is that the greater yields that hopefully will ensue will allow the farmers to make enough money to both pay back their loans and have more money left over than before the project started. While this may sometimes be true for the short term, long-term problems of pesticide resistance and pest resurgence often cause profits to falter.

Of the nine projects we analyzed in some detail, two-thirds (six) were Agricultural Development Projects (ADPs), all of which focused on improving the yields and income of smallholders, primarily by promoting higher-value

cash crops and financing input-intensive "technical packages." The other three projects also focused on supporting cash crop production.

One "IPM" Project

As for the "requirements" of the Guidelines mandating IPM as the basic pest control strategy, none of the SARs except for one in the Sudan (Third Agricultural Rehabilitation Project or ARP III) even *mentioned* IPM, which is supposed to be the major thrust of Bank-sponsored pest control. This was true both for the projects looked at in detail, as well as those looked at more cursorily. Instead, the bulk of the projects appear to use the unilateral chemical approach to pest control.

"None of the [Staff Appraisal Reports] except for one in the Sudan . . . even mentioned IPM."

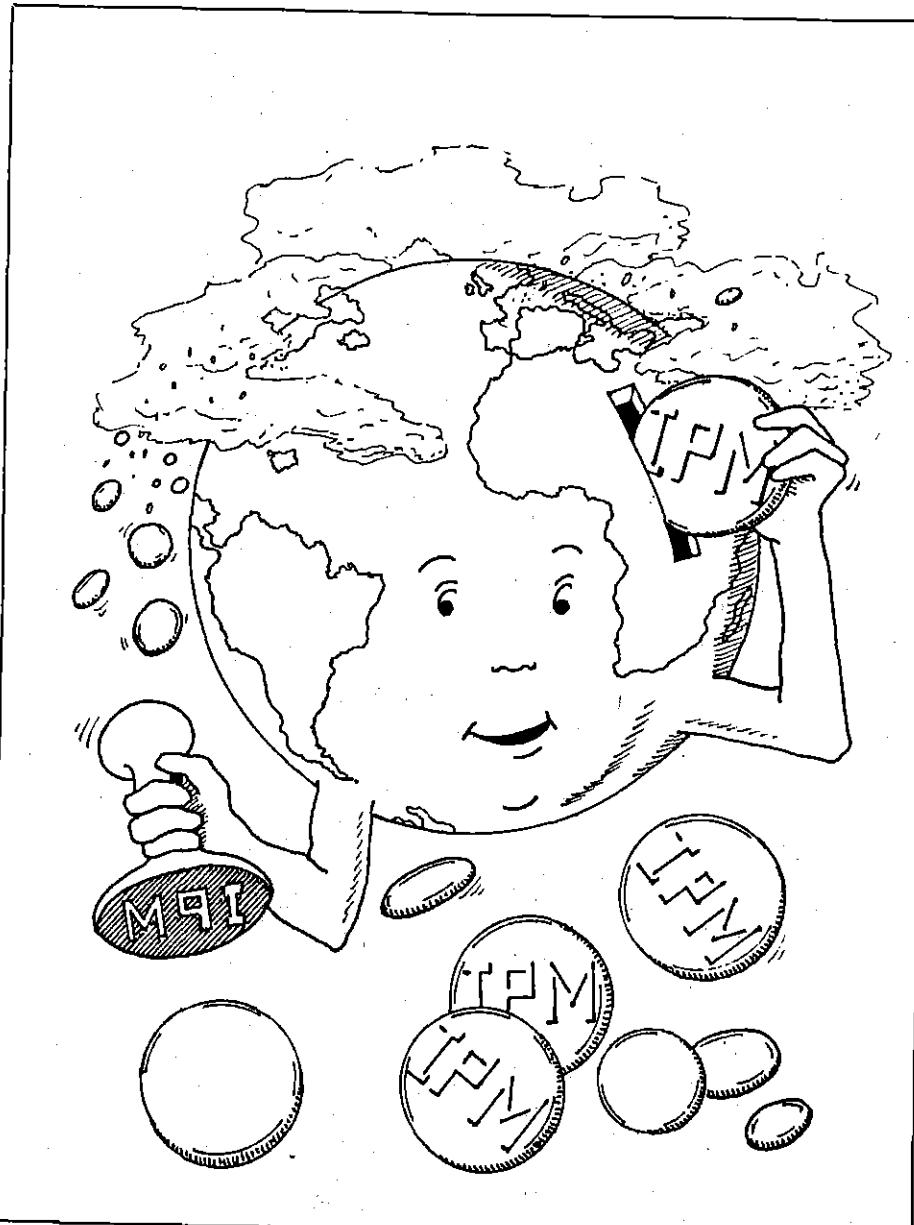
The "technical packages" financed by these projects often involve quite marked increases in pesticide use. For example, an ADP in Egypt projects increases of 9-fold, 9.5-fold, and 8.6-fold for insecticide, fungicide, and herbicide use, respectively, over the six-year course of the project. An ADP in Mexico will increase spending on pesticides up to 16.5-fold for some of the farm types it is assisting. For an ADP in Yemen, pesticides are being introduced into an area where they were formerly not used at all.

The ARP III in the Sudan, which focuses on cotton production, is a welcome departure from the other projects we examined. It explicitly recognizes the problems created by pesticide use and gives explicit attention to IPM. However, it should be pointed out that this attention to IPM for pest control was dictated, in part, by the impending collapse of cotton production due to many years of heavy pesticide use. In addition, of the \$85 million the World Bank is providing for this one-year project, over \$50 million will go toward purchasing pesticides, indicating that while the project may be attempting to encourage adoption of IPM in Sudan's vast cotton plantations, it is still financing a chemical-based approach.

The requirements in the Guidelines concerning pesticide handling, packaging, storage and application safety receive virtually no explicit attention in the SARs we analyzed, so it is hard to say the extent to which they are being implemented. The lack of explicit discussion probably suggests such issues were not seriously considered, which if true, is quite disturbing.

Some Pesticide Selection

Implementation of the Guidelines concerning pesticide selection, particularly the parts designed to limit acutely toxic and very persistent pesticides, appears to be the area in which the Bank has had the most success. The SARs for over half the projects we examined state that the project will avoid the use



Robert Coddington

"The resistance from borrowers [to avoiding particularly hazardous pesticides] often stems from the fact that the more broad-spectrum, highly toxic chemicals tend to be cheaper than the less hazardous alternative chemicals."

of acutely toxic pesticides. Four of these five SARs also state that they will avoid use of pesticides that pose chronic hazards.

An internal Bank memorandum similarly concludes that pesticide selection is the area of the Guidelines most effectively implemented. According to this memorandum, the pesticides to be used in over 40 projects have been examined in detail since announcement of the Guidelines. In 15 of the cases, some pesticides were disapproved. This included the Southern Borno ADP in Nigeria, where lindane and aldrin initially had been suggested for crop storage and plant protection.

This memorandum also notes that borrowers, and sometimes manufacturers, have been upset over the rejection of specific pesticides in certain projects. The resistance from borrowers often stems from the fact that the more broad-spectrum, highly toxic compounds tend to be cheaper than the less hazardous alternative chemicals.

Recommendations: Bank Policy

Our limited investigation found major problems in the Bank's implementation of its Pesticide Guidelines. We gave recommendations in the areas of Bank policy, structure, and operations to help deal with these problems.

"A true IPM-based project in a traditional system . . . would take a more 'bottom-up' approach, involving participation by the local population in the design and implementation stages."

In terms of Bank policy, we feel that the Bank needs to come to grips with what it really means to successfully implement IPM. IPM is not just another "magic bullet" that can be substituted for pesticides in an "technical package." Rather, IPM is a thought-intensive strategy, which requires taking a more holistic approach to the problem, in part by looking at the entire agricultural system. In the case of a project trying to assist traditional subsistence agriculture, IPM requires a dif-

ferent approach to development than the one the Bank is currently practicing.

"Overall, Bank projects need to give much more money for human resources and research and much less for inputs than at present."

An example will make the point clearer. The Wadi Al-Jawf ADP in Yemen is typical of the Bank's approach to development projects involving traditional systems. Wadi Al-Jawf's social structure is based on an indigenous tribal system. Land is fairly equitably distributed and the farming system uses few external inputs. The Bank recognizes that such a system has proved sustainable in the long term "Even with the limited resources at their disposal, the Yemenis have achieved a remarkable degree of agricultural efficiency using traditional techniques . . . The bench terraces constructed through the centuries by generations of peasant farmers provide a level area of deep soil and collect runoff water."⁵

However, in designing the ADP, the Bank chose to introduce and push "modern technical packages for increasing crop yield." Indeed, the project summary states that "The main risk is the possible hesitation of tribal population to adopt various technical packages." Rather than seek to understand the basis of this hesitation, and whether it might have anything to do with the peasants' centuries of experience with the local ecology, the project will try to manipulate the farmers into using the packages by providing both irrigation and potable water supplies to show the population that the "technical package" is good.

Pesticides are an important component of such "technical packages" and their use is designed to grow over the course of the project. According to the Bank's economic models, by the end of the project, the perennially gravity-irrigated farms would spend 22-23 times as much on pesticides as they did in the first year of the project, while the well-irrigated farms would spend 27 times as much.

A true IPM-based project in a traditional system would look fundamentally different than what the Bank proposed. The project would take a more "bottom-up" approach, involving participation by the local population in both the design and implementation stages. The first stage of the project would involve working with the local farmers to understand the ecology of their agricultural system, what they presently do to control pests, and what their needs are. Indigenous people often have a great wealth of knowledge about their environment that needs to be tapped, rather than ignored. Any IPM system should modify, or build upon, the local traditional system.

"We also recommend that the Bank conduct environmental impact analyses as part of the appraisal process, prepare environmental impact statements (EISs), and make them available in draft form for local non-governmental organizations and other interested parties for comment and input."

Overall, Bank projects need to give much more money for human resources and research and much less for inputs than at present. Wherever possible, all efforts should be taken not to introduce pesticides but to maximize natural mortality factors. Pesticides generally disturb the ecology of the local system, particularly populations of natural enemies. Completely non-chemical pest controls will have a greater chance for success in situations where pesticide use has been avoided than where it already has destroyed or disrupted many of the natural control factors.

Bank projects should include a major financial commitment to researching and developing sustainable, non-chemical pest control, a step the Bank has yet to take. Furthermore, the Bank must provide the technical assistance to implement IPM systems through extension and

training that are not linked to chemical companies. The Bank should also aim, through its training, to develop local expertise and research capabilities.

The Bank needs to change its policy as to how it conducts the economic analyses that underlie its lending decisions. We recommend that the economic analysis in the projects be altered to take into account the long term and to explicitly include the environmental and social costs of pesticide use that do not presently appear in cost-benefit analyses.

We also recommend that the Bank conduct environmental impact analyses as part of the appraisal process, prepare environmental impact statements (EIS), and make them available in draft form for local non-governmental organizations (NGOs) and other interested parties for comment and input. Indeed, the Bank should have local people and NGOs help identify potential environmental impacts of projects.

Recommendations: Bank Structure

In terms of structure, we found that the Bank lacks a concrete mechanism to ensure that the Guidelines are followed. Two recommendations would improve the present situation:

1. The new Environmental Units created by President Barber Conable in 1987 must be responsible for signing-off that each Guideline requirement has been met before the SAR can go to the Board of Directors for approval.

2. Staffing for implementation must be increased. At the very least, one person in the Environmental Unit in each of the four regions must be assigned full-time to Guideline implementation, and a full-time person in the central Environment Department should be assigned to pest control.

Recommendations: Bank Operations

The Bank could make some changes in operations to improve implementation of the Guidelines:

1. The Guidelines should be explicitly incorporated into the Bank's Operations Manual.

2. The Guidelines should be explicitly discussed, item by item, in the SAR for all projects with a pest control component.

3. The Bank needs to be more open and disclose more information. The Bank's secretiveness creates a serious barrier to good decisionmaking.

4. The Bank needs to consult and work more effectively with NGOs. The Bank should not only welcome, but ac-

tively solicit NGO input or project development and implementation. In-country Resident Representatives for the Bank should receive training both in IPM and in working with NGOs.

The Bank Revises the Guidelines

During our review project, we learned that the Bank was considering revising the Pesticide Guidelines. The World Bank Pesticide Advisory Panel was formed to review the draft Pest Management Guidelines. The panel is composed of six people: an NGO representative, an environmental scientist from the Bank, an ecological effects advisor from USEPA, a human toxicology advisor from WHO, a pest management advisor from FAO, a representative from a developing country, and a representative from the agrochemical industry.

"Greenpeace, Sarojini Rengam, and the Institute prepared detailed comments and proposed changes to the [World Bank] panel and then argued effectively for their inclusion in the new Guidelines."

Greenpeace, who has been working on trying to influence the pest control policies of the Bank and who is focusing on the ARP III in Sudan as their main case study, helped convince the Bank to have the NGO representative come from a Third World NGO. The person selected was Sarojini Rengam, Research Officer with the International Organization of Consumers Unions, Regional Office for Asia and the Pacific, and a regional coordinator of the Pesticide Action Network (PAN).

The Panel met on December 7 and 8, 1988 to discuss the new draft Pesticide Guidelines. Greenpeace had obtained copies of the draft and sent it to various organizations for comment. Greenpeace, Sarojini Rengam, and the Institute prepared detailed comments and proposed changes to the panel and then argued effectively for their inclusion in the Guidelines.

In addition, a letter, signed onto by representatives of Greenpeace, In-

stitute for Consumer Policy Research, International Organization of Consumers Unions Regional Office for Asia and the Pacific, National Coalition Against the Misuse of Pesticides, Pesticide Education and Action Project, and the Sierra Club International Pest and Pest Management Project was sent to the person in charge of producing the new draft guidelines. The letter made four basic points:

1. The new guidelines did not adequately discuss problems created by pesticide use and did not provide a sufficient rationale for the IPM approach being endorsed.

2. The concept of IPM use was inadequate as it emphasized pesticides and presupposed that chemicals are necessary components of IPM systems.

3. The new guidelines did not give enough emphasis as to how the guidelines will be implemented in Bank operations and projects.

4. The revision failed to provide for farmers to be involved from the earliest stages of project design, through implementation and devaluation of IPM systems.

The results of the Panel meeting were positive. Most of the wording changes that we suggested were accepted for incorporation into the draft. Overall, the group of us that worked on commenting on the draft Guidelines did well; Bank staff, at least those involved in the meeting, were making a sincere effort to minimize pesticide problems. However, the final draft of the new Guidelines has not been released yet, and may be altered by higher levels in the Bank. How serious the higher levels in the Bank are about implementing these Guidelines remains to be seen. NGOs need to continue to monitor progress on implementation as well as continue to push for NGO involvement, public access to information, and environmental impact statements, or assessments.

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Where There's a Will There's a Way: Indonesia, Rice, and Alternatives to 57 Pesticides

By Kay Treakle and John Sacko

Pesticide reform worldwide requires action by governments, non-governmental organizations (NGOs), individual citizens, courts, and international agencies. This article describes impressive actions taken by the Indonesian government to cut pesticide use and train farmers in integrated pest management for rice production.

The following article, "PAN Indonesia: A Non-Governmental Organization Moves Its Country Toward Alternatives to Pesticides," (pp. 20-21), describes the impressive, longterm work by PAN Indonesia, a grassroots organization, to develop and disseminate alternatives to pesticides in a number of other crops.

-Ed.

After years of relying on chemical insecticides to control rice pests, the Indonesian government has adopted integrated pest management (IPM) as a national policy and banned the use of 57 pesticides on its important rice crop. As a result, Indonesian farmers have dramatically cut their use of toxic pesticides and increased yields in rice paddies across the archipelago.

Indonesia is the first country in the world to take the radical step of institutionalizing a pest control strategy by presidential decree. The commitment

of President Raden Suharto to IPM reverses two decades of agricultural practices brought on by the "Green Revolution," which promised miracle rice yields but ultimately delivered devastating crop losses and an expensive chemical addiction.

Pesticides for Self-Sufficiency?

Indonesia got started on the pesticide treadmill in 1967 when, upon taking office, President Suharto pledged to make his country, then one of the world's largest rice importers, self-sufficient in rice. The ingredients for his Green Revolution were simple: grow strains of rice specially developed to stand up straight, produce more kernels, and resist insects and diseases. Add irrigation, heavy doses of pesticides and fertilizers, and the technological package is complete. By the early 1980s, Indonesia's impressive yields made this country of 170 million people self-sufficient in rice.

"During the 1970s, a small flying insect called the rice brown planthopper destroyed millions of tons of Indonesian rice."

Kay Treakle is the director of the Greenpeace pesticides campaign and John Sacko is a freelance writer working with the Washington, DC Greenpeace canvass program.

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Greenpeace USA; 1436 U Street, NW; Washington, DC 20009; (202) 462-1177.

subsidies in the world. During the first decades of Indonesia's Green Revolution, the government subsidized as much as 85 percent of pesticide costs, spending an astonishing \$150 million a year.

The widespread adoption of the chemical approach left many farmers with the idea that pesticides are progressive and modern. With the cost of chemicals inconsequential, the prevailing attitude became, "the more the better."

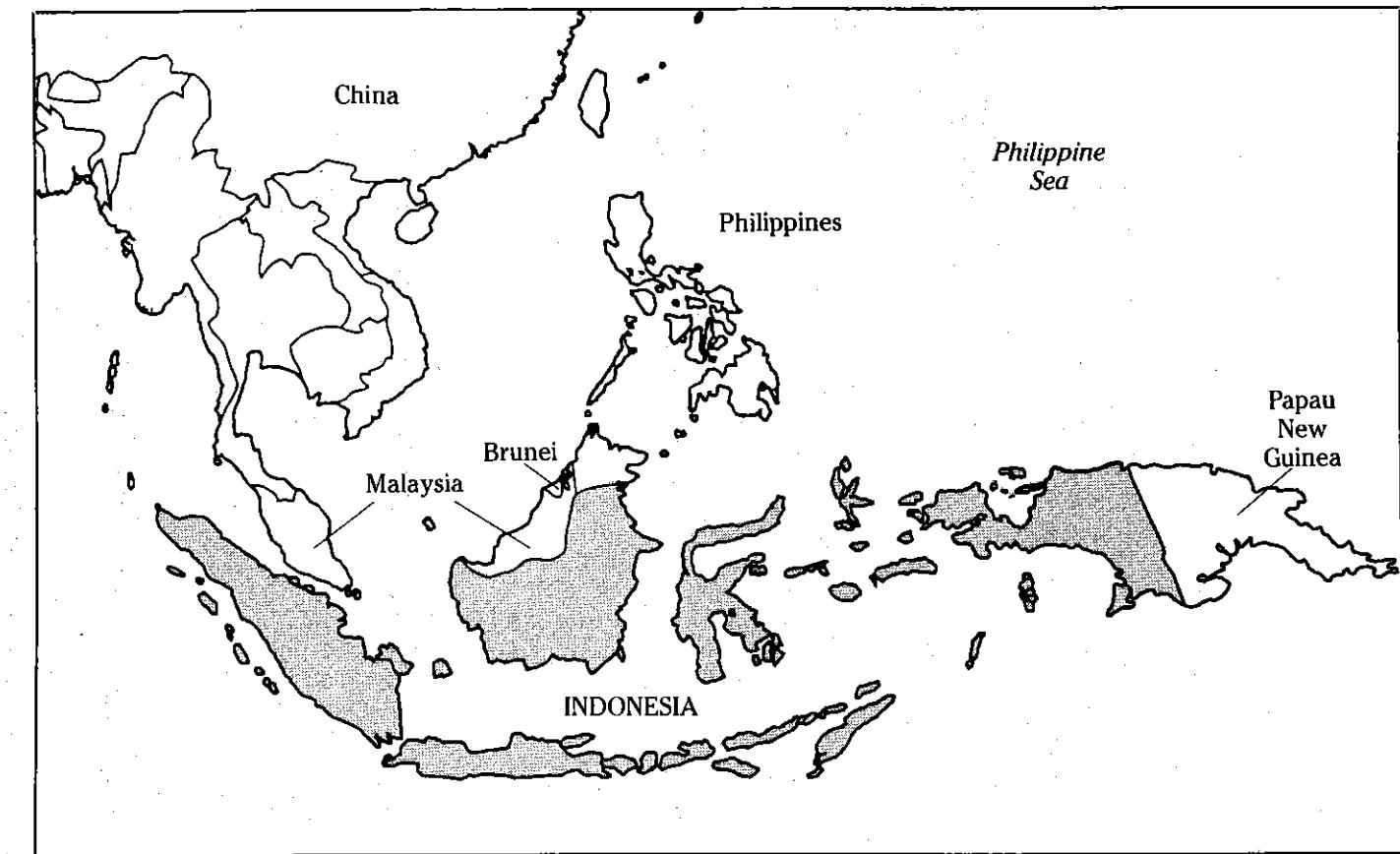
The Green Revolution Turns Brown

But the "progressive" pest control strategy eventually wreaked havoc on Indonesia's rice fields and turned Indonesia's Green Revolution brown. During the 1970s, a small flying insect called the rice brown planthopper destroyed millions of tons of Indonesian rice. Using typical Green Revolution methods—the introduction of a new strain of rice, IR 36, and an arsenal of chemicals—the pest was suppressed. But only temporarily.

In 1986, the planthoppers were back. And by the end of the season, 100,000 hectares, roughly 600,000 tons, of rice were devastated. Chemical applications, in some cases up to 15 a month, did nothing to prevent disaster.

The fact is, for Indonesia's rice fields, along with those in Thailand and the Philippines, the use of pesticides actually contributed to the destruction of rice by the planthopper. Long-term studies now show that there is virtually no correlation between the use of pesticides and the increased rice yields.

The conclusive evidence was developed by scientists with the Gadjah Mada University and the Food and Agriculture Organization (FAO) of the United Nations, along with Dr. Peter Kenmore, then a graduate student from the University of California at Berkeley. Their work concluded that the use of pesticides killed off the planthopper's natural enemies including wolf spiders, lady beetles and wasps. The pest pro-



blem was further exacerbated by spraying such highly toxic pesticides as methyl parathion and diazinon, which actually stimulated the reproduction of the brown planthopper. AN FAO report concluded that the planthopper "was a pest because of, and not in spite of, pesticide applications."

Having discovered the cause of the hopper infestation, the problem then became how to promote its cure. Neither President Suharto in Jakarta, nor the rice farmer in the fields would have willingly given up pesticides without an effective alternative. Fortunately, that alternative, IPM, was then being successfully tested in the field.

The IPM approach involves conserving the hopper's natural enemies, manipulating the planting time to interfere with the steady supply of planthopper food (rice), and spraying only when the pests actually became a threat. At that point, farmers would apply chemicals designed to do the job without stimulating planthopper reproduction.

Translating IPM from field tests to a national policy was a monumental undertaking,

which has become one of the most progressive and successful agricultural extension programs in the world. Based on a bottom-up approach to decision-making and training devel-

oped by an interdisciplinary team of scientists, including anthropologists, entomologists, and social scientists, the Agricultural Extension Service was able to train more than 15,000 farmers in the IPM techniques in the first year. The decentralized approach worked like a telephone tree: 30 trainers taught IPM to 200 master field trainers, who in turn trained farmers in groups of 20 to 30. These groups subsequently became the nucleus for training other farmers. The government also supplied 1,000 motorcycles so that trainers and pest observers could swarm around the countryside monitoring pest infestations and teaching farmers how to cope without pesticides.

During the first season, pesticide use dropped drastically, and in the third season since the IPM decree, overall insecticide use fell 90 percent. During that same period, rice yields were up, from 6.1 tons per hectare in 1986 to 7.4 ton per hectare in 1987. Farmers' costs dropped from 7,500 rupiah in 1986 to 2,200 rupiah in 1987, despite an overall increase in the price of chemicals.

Since Suharto's decision, more and more farmers have laid down their backpack sprayers and are taking greater responsibility for managing their crops. Increased incomes should

help the economy, and the government will be able to use money previously used to purchase pesticides to further implement IPM.

The only losers in the IPM deal are the pesticide producers, including such multinational giants as ICI, Ciba-Geigy, Bayer, Monsanto and Hoechst. Dow Chemical Pacific lost 80 percent of its business almost overnight, including half its shipment of Dursban, which was ordered before the ban. Dow has also had to postpone construction of a \$4 million Dursban production facility. And Ciba-Geigy is now reconsidering plans to build a \$10 million organophosphate manufacturing plant.

Petitions against the order have been submitted to the government, and the companies have complained that the severity of the brown planthopper threat has been exaggerated by the Indonesian government in order to justify a switch in agricultural policy.

But Indonesia has no intention of bowing to industry pressure. The government plans to train 2.5 million farmers by 1994. And other Asian countries—including such important rice producers as China, the Philippines, Malaysia, Thailand, and India—have recently developed similar projects with FAO assistance

PAN Indonesia: A Grassroots Organization Moves Its Country Toward Alternatives to Pesticides

By Riza V. Tjahjadi
(Adapted by Caroline Cox)

During the 1967-1968 growing season, the Indonesian government began its *Bimas Gotong-Royong* (massive guidance with traditional mutual cooperative activity) program. This program involved widespread use of newly developed high yielding rice varieties together with greatly increased use of and government subsidies for chemical pesticides and fertilizers. Pesticide production in Indonesia, as well as imports of pesticides, increased dramatically.

Between 1978 and 1982 pesticide consumption increased 710%. By 1986 1.7 kilograms (.78 pounds) of insecticide were applied per hectare of land cultivated.¹

Along with increased pesticide use came increased pesticide abuse; the Pesticide Action Network Indonesia (PAN Indonesia) was formed in 1982 to involve Indonesians, especially villagers, in fighting pesticide misuse.

Grim Statistics

The extent of the pesticide problems in Indonesia can make gruesome reading. Until this year (1989), the Indonesian government subsidized 80% of farmers' pesticide costs; the total cost reached 25.4 billion U.S. dollars.² At the same time, many farmers were un-

Riza Tjahjadi has been the assistant coordinator of PAN Indonesia since June, 1988. He is also the managing editor of the Indonesian Action Research Network (JARI) bulletin, Alternatif.

Caroline Cox is a biological control researcher in the Department of Entomology, Oregon State University.

PAN Indonesia; Jl Penjernihan 1; Komplex Keuangan No. 15; Pejompongan; Jakarta 10210; Indonesia; Telephone: 320359/586820.

aware of proper safety procedures, or did not have appropriate safety equipment,³ so that stories of pesticide poisoning are widespread. A few examples follow:

1. In August 1982, twelve people in Central Java died after eating a meal as part of a traditional celebration. Their deaths resulted from DDT poisoning; 17 of the 28 different foods at the meal were contaminated by DDT.³ Two months later, 19 people died in the northern part of the same province after eating DDT-contaminated snacks.⁴

Action Research

In addition to publicizing pesticide misuse, and educating Indonesians about the subject, PAN Indonesia's approach to their pesticide problems has been to sponsor an alternative pest control program based on what they term "Action Research."

Action Research uses organic fertilization techniques and intercropping of companion crops to improve yields and reduce pest problems. Pest problems are managed through the use of botanical pesticides (tobacco leaf and chile pepper extracts), hand-picking and other mechanical controls, and the use of chemical insecticides only when pest abundance is above the economic threshold (the lowest abundance of a pest that will cause economic loss).

The goal is not simply to churn out scientific research, but to instill in farmers and farm communities the belief that they can solve their own agricultural problems without reliance on outside inputs.⁵

The Action Research program has focused on vegetable crops grown in upland areas because previous research had not been adequate to set economic thresholds for many of the pests of these crops. In addition, the amount of pesticides used on these crops was higher than that used in Indonesia's other cropping systems and Indonesia's Department of Agriculture had focused its IPM efforts on rice (see

p. 18). There was also some evidence that upland vegetables had pests and diseases that were resistant to pesticides.

Action Research's goals are to provide immediate and direct benefits to the farmers involved, rather than to conduct academic integrated pest management research. The program tries to make use of existing practices and social conditions. All of the activities of the research programs are adjusted to suit local needs, developing models of how farmers can make the transition to sustainable agriculture.

PAN Indonesia feels strongly that farmers should gain from the process as well as the outcome of research. The design of the research plots and the equipment and worksheets are all designed for immediate use. While PAN Indonesia coordinates the program, the actual research is carried out by local groups.

Intercropping Experiments

PAN Indonesia implemented research projects during the 1985-1986 growing season in three villages: one each in West Java, Central Java, and East Java. Researchers selected cabbage-shallots, cabbage-celery, and eggplant-red pea as the intercropping combinations.⁶

Results after the first season showed that while abundances of some pests were reduced, abundances of other pests were equal to those found in monoculture fields where pesticides were used. The amounts of pesticides used and the frequency of applications were reduced about 75% compared to the schedule of pesticide applications used on monocultures. Cash inputs therefore were much reduced, although all three sites operated at a loss.¹⁰

During the 1986-1987 growing season, research continued at two of the sites and another village was added to the program. Researchers added more intercropping combinations to the experiments: Potato-garlic, potato-green bean, green onion-carrot, and shallot-carrot. In addition, some comparison plots which used monocultures and full pesticide schedules were included in the program. The project participants kept detailed records of pesticide use and labor costs.¹¹

PAN Indonesia is also working to encourage farmers to grow traditional rice varieties instead of IR 64, a high yielding rice strain that has proved to be highly susceptible to bacterial disease.

In East Java, PAN Indonesia is starting a community seed bank to preserve traditional rice varieties and is encouraging small farmers to use these varieties because they have a longer growing season than the high-yielding varieties. This gives the farmers time to

Table I
Pesticides produced and imported in Indonesia

Year	Production (metric tons)	Imported	Total	% Change
1978	9,128	4,272	13,400	—
1979	20,812	3,389	24,201	80.6
1980	25,671	6,139	31,810	31.4
1981	33,576	1,237	34,873	9.4
1982	42,369	2,886	45,255	30.0+

"Until 1989, the Indonesian government subsidized 80% of farmers' pesticide costs; the total cost reached \$25.4 billion U.S. dollars."

work for large landholders and supplement their income.

PAN Indonesia is also working internationally. The Food and Agriculture Organization (FAO) has asked PAN Indonesia to help with the development of an IPM program for Sri Lanka, the Philippines, and Indonesia. PAN Indonesia is also organizing a travelling workshop to teach community seed bank and organic farming techniques throughout ASEAN (Association of South East Asian Nations) countries. ■

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Where Paraquat Starts: ICI and the United Kingdom

By Barbara Dinham

Paraquat is one of the world's most widely used weedkillers. Its weedkilling effects were discovered by ICI (then Imperial Chemical Industries) in the late 1950s and the product was first sold in 1962.

There are many formulations of paraquat, of which the main one is Gramoxone. ICI is still the major producer of paraquat. The company's biggest selling agrochemical, paraquat, contributes up to 33 percent of ICI annual agrochemical sales. In 1987 (a boom year) paraquat sales were over \$5 million, 24% of the company's pesticide sales. Paraquat products are sold in about 130 countries, for use on large and small farms, on plantations and estates, and on smallholdings. According to ICI, paraquat has become an integral part of many crop production systems.

Most of ICI's paraquat production takes place in the United Kingdom (UK), and it is one of ICI's major exports; about 90 percent of all the company's agrochemical sales are outside the UK. However, the extraordinary

success of the product meant the company needed to have production or formulation sites closer to its markets. ICI in the UK was also concerned about all production being based at one source. Its strategy has been to retain its grip on the market by investing in highly efficient large-scale manufacturing plants in the USA, Japan, and Brazil, and small end-stage processing units in India and Malaysia.

The Company

ICI is one of the biggest agrochemical companies in the world, ranking in third place behind Ciba-Geigy and Bayer. Its agrochemical sales in 1987 amounted to almost \$21 billion (8.6 percent of the company's total sales). It is the UK's biggest exporter, and has manufacturing sites in more than 40 countries and products sold in over 150 countries.

In the past, ICI had big interests in bulk chemical production, but the collapse of the chemical market in the 1970s led to a shift in strategy for the eighties towards specialty products. Half its output is now accounted for by "effect chemicals," compared with 35 percent eight years ago. It remains predominantly a chemical company, with products grouped into three main areas: consumer and specialty (39%); industrial (46%); and agriculture, including pesticides and fertilizers (15%).

The corporation's Plant Protection Division, with its international headquarters at Fernhurst in the UK, controls pesticide production. The main herbicide sites are at Huddersfield (diquat: Region) and Widnes (paraquat: Gramoxone). A plant at Yalding in Kent formulates and packs smaller quantities. Insecticide production is centered at Grangemouth in Scotland.

Paraquat Production in the UK

Since 1961 the manufacture of paraquat in the UK has been carried out at ICI's Pilkington Sullivan Works in Widnes, Cheshire, in northwestern England. Four different manufacturing processes have been historically used.

From 1961-1963, there was a high temperature batch process sodium plant; from 1962-1967 a magnesium process plant. Since 1966, a low temperature sodium plant (called P2) has been used in which the process is continuous. The P2 plant is automated and is mainly operated remotely from a control room.

In 1985 a new plant (called P3) opened in Widnes which operates alongside P2. The new P3 plant is simpler and has lower capital cost than the P2 technology. The only other plant of its kind is operated by ICI in Brazil. This technology is based on the use of sodium cyanide, which minimizes production dust.

In the early eighties, when ICI was modernizing its paraquat plant, it also sought to lessen dependence on a single production site in the UK. However, attempts to open a second site led to opposition from the workers at Widnes, who feared losing jobs and wanted all production kept there. There was also opposition from the local community at the proposed site at Huddersfield, Yorkshire, where there was concern about toxic emissions from the existing ICI diquat plant.

The Huddersfield plans were shelved. The local group opposed to paraquat production (Paraquat Action Committee) was pleased with the apparent success of their campaign, although the struggle had divided local opinion: the Huddersfield workforce was keen to expand the plant and increase jobs. ICI, however, may only have been marking time; in 1988 they applied to the Huddersfield Council for permission to expand their plant to produce 2,000 tons of paraquat a year.

The paraquat from the two manufacturing plants at the Pilkington Sullivan Works is jointly stored and packed. Larger-scale formulation (for 5 liter bottles, drums and tankers) is done here. Small quantities of paraquat are prepared at the formulation plant in Yalding, Kent. In addition, a chemical precursor of paraquat, bipyridyl, is sold to other countries where it is

quaternized and formulated and sold as paraquat.

In response to worldwide concern about the number of deaths from pesticide poisoning, ICI developed a policy in 1983 of adding a blue dye to reduce the likelihood of mistaking paraquat for a cola drink or coffee, and a powerful emetic to create an instant vomiting reaction. This has been aggressively marketed as a "new" product, Gramoxone Super, aimed at fending off competition and capturing new markets. In some formulations, a stenching agent (to produce a foul smell) is added, and this has caused some problems for workers in the formulation process.

Health and Safety in the UK Plants

ICI's record in health and safety matters in production is good, and is said to have about half of the accident rate of the UK chemical industry as a whole. In 1980, the government introduced the "Notification of Accidents and Dangerous Occurrences Regulations." ICI reported six incidents at its agrochemicals plants between the time the regulations came into effect and August 1985. One of these occurred at the company's formulation plant in Yalding, where there was also a fire initiated by a pesticide product. During this period, ICI received only one written notification from safety representatives at its agrochemicals plants over unsafe or unhealthy working conditions.

It should be noted that "notifiable" accidents refer to those that keep employees off work, and companies are known to switch workers to "soft" jobs following an accident to reduce their number of "notifiable" accidents.

ICI has a reputation of providing a high level of employee training for all staff, as well as special training for safety representatives. At the paraquat plant at Widnes, safety representatives were known to attend trade union health and safety courses in addition to the company's own training. It is not known whether this practice is also followed in manufacturing sites outside the UK.

Workers involved in the formulation process have experienced periodic headaches, sore throats, drowsiness and other unpleasant symptoms since 1981. The company carried out a large number of tests to identify the precise cause, thought to be related to the stenching agents, and improved both ventilation and container seals.

However, the record in the old paraquat plants was more critical. In the first plant, pyridine was converted into polypyridyls and tarry by-products, which caused operating difficulties and increased the risk of worker exposure. Workers used protective gloves and safety helmets, but chemical fumes permeated the general atmosphere and the chemicals penetrated the protective clothing and condensed on the skin. Twenty-eight workers developed keratosis and skin lesions. ICI never admitted that the chemicals could be potentially carcinogenic and negotiated compensation without admitting liability.

Paraquat Production Worldwide

While paraquat still originates primarily from ICI, the patent rights have expired. The other companies making it are mainly small, and based in the Third World, in countries which cannot afford to develop their own products. ICI's successful marketing brought with it the need to develop paraquat plants in key markets. There are now plants in the USA (Bayport, Texas), Japan, Brazil (possibly two plants), India (a quaternization plant), and Malaysia. Apart from the history of the Malaysian plant, little is known about other production sites.

"There are now paraquat plants in the USA, Japan, Brazil, India, and Malaysia."

Paraquat Production and Health and Safety in Malaysia

In Malaysia, paraquat is produced by the Chemical Company of Malaysia (CCM), 50 percent owned by ICI. The company makes a range of fertilizers, chlor-alkali chemicals, and agrochemical products at the Padang Jawa works in Kelang. Paraquat is the main product.

In 1981 public concern over the possible effects of atmospheric and liquid effluents from CCM's plant prompted the Ministries of Environment and Health and the Department of Factories

and Machinery to investigate health, safety, and environmental conditions in and around the plant. Nearby residents had complained "... that the fumes from the factory cause rashes and sore eyes."

The survey concluded that workers in the Gramoxone plant were at risk of being exposed to paraquat aerosols above the Threshold Limit Value (TLV). For workers' urine samples to have paraquat concentrations greater than a specified level, absorption of the substance by ingestion or inhalation must have occurred. Since absorption by ingestion was most unlikely in the plant, it could be implied that absorption was by inhalation and the paraquat aerosols were in the respirable size range, since only in this size range could the aerosols be completely absorbed. This hazard if not checked would cause adverse health effects to the workers.

The Department of Factories and Machinery directed ICI to correct this. The workforce felt that there had been no changes by May 1983. The worksite secretary, Mr. Sivanathan, then wrote to government departments as well as the plant manager listing health and safety concerns at the works, with particular reference to paraquat production in the quaternization plant. His letter said that "... We can notice traces of BIP (bipyridyl) around the area and also we feel working in this plant is hazardous and dangerous. It also affects workers' health." Shortly afterwards, Mr. Sivanathan was dismissed for "serious misconduct;" he had embarrassed the company. In 1985, a further investigation by the State Government advised that the company should take measures to ease pollution.

This history of the Malaysian plant raises the question of production in Third World countries where it is often more difficult to conduct health and safety checks. It seems clear that conditions in the CCM factory have been poor compared with those generally found in ICI factories in the UK. ICI must be aware of these conditions, as the company says that they "... check on the standards in our factories overseas and those with which we are associated because they make our products, both from the point of view of worker safety and of the environment. This involves visits of our technical experts, perhaps to a dozen different overseas plants in a year."

Barbara Dinham, a researcher with Transnationals Information Centre in London, wrote this article based on research carried out by Czech Conroy in 1985. Both Barbara and Czech serve on the board of Directors of the Pesticides Trust, a United Kingdom pesticide reform organization working to reduce pesticide abuse in both industrialized and southern countries.

The Pesticides Trust, 20 Compton Terrace, London N1 2UN, United Kingdom; Tel: (01) 354 3860.

Further research on paraquat production is being carried out at present and Barbara Dinham will be grateful for any information sent to her at Transnationals Information Centre, 9 Poland Street, London W1V 3DG, United Kingdom.

Paraquat in Malaysia: The Death Toll Mounts

By Sahabat Alam Malaysia

Three years ago, in an earlier Journal of Pesticide Reform issue that focused on international pesticide use, we carried an article by Sahabat Alam Malaysia entitled "Paraquat: Another Scourge From the Merchants of Death" (JPR 6(1):10-13). This article restates and updates the agony of a Malaysia subjected to and subjecting itself to paraquat. At some point this particular agony must end.

The story of paraquat in Malaysia is the story of paraquat in countries throughout the southern hemisphere: Multinational corporations, worship of production even when the human sacrifices are clearly too many, suicide by pesticide, bureaucracies that fail to protect their country's citizens, irrational dismissal of nonchemical alternatives, and citizen groups who faithfully work toward a better way.

—Ed.

Sahabat Alam Malaysia (SAM—Friends of the Earth Malaysia) is a non-governmental organization involved in environmental and developmental issues.

Established in 1977, SAM has been working closely with various affected communities throughout the country such as farmers whose crops are destroyed by pollution and pests, fishermen whose livelihood is threatened by depleting marine resources and encroachment of trawlers, estate workers whose health and safety are affected by the use of pesticides and toxic chemicals, villagers affected by development projects, indigenous/tribal groups whose lands are taken for timber exploitation, etc.

SAM is also the coordinator of the Asia-Pacific People's Environment Network (APPEN—an informal coalition of over 300 non-governmental environmental organizations in the Asia-Pacific region).

SAM; 43 Salween Road; 10050 Penang, Malaysia.

The number of deaths resulting from suicidal, accidental and occupational paraquat poisoning in Malaysia continues to be alarming. A spate of deaths caused by paraquat poisoning in 1985 led to a national acknowledgment of the lack of control over this deadly hit-and-run herbicide. Since then much has been claimed about stricter regulation and more stringent measures over the use of paraquat. However the frequent reports of death and poisoning cases refute this claim. The situation is out of control and the only solution is to ban paraquat.

Paraquat

Paraquat is a widely-used herbicide that destroys most broadleaved weeds and grasses within about 72 hours of application by disrupting the process of photosynthesis.

"[More] than half of all paraquat poisonings are fatal."

According to the United Nations World Health Organisation (WHO), paraquat is among the most hazardous chemicals in existence. When ingested or absorbed by humans, this highly toxic chemical causes injury primarily to the liver, kidneys and lungs. A mere teaspoon of concentrated paraquat is enough to kill an adult person. In many cases, a smaller dose leads to lung damage followed by death due to pulmonary fibrosis two to three weeks later. Skin contact and inhalation of paraquat can result in stomach aches, vomiting, diarrhea and general muscle aches. There is no known antidote to paraquat.

The danger of paraquat may be summed up as follows:

- Acute poisoning arising from breathing a paraquat mist/aerosol while spraying
- Acute poisoning from absorption of paraquat through unbroken skin

- Acute poisoning from swallowing small quantities of paraquat either intentionally or accidentally
- Chronic poisoning from continuous long term exposure to paraquat
- Risk of residue accumulation in soil, water, livestock, the food, the human body.

Paraquat in Malaysia

Paraquat is extensively used in Malaysia for weed control. It is sold under at least a dozen brand names and is commonly known as "kopi-o" (black coffee) in rural areas because of its color. The most widely distributed brand is Gramoxone manufactured by ICI Agrochemicals of Malaysia (see "Where Paraquat Starts: ICI and the United Kingdom", p. 22.)

Paraquat poisoning is alarmingly common throughout Malaysia. According to the Malaysian government's Chemistry Department, in the period 1978-1985 paraquat accounted for 66% of 1,442 reported pesticide poisoning cases. There were 46 reported cases in 1978 and this increased sharply each year to 211 cases in 1985. Many more cases are unreported.

Statistics also show that more than half of all paraquat poisonings are fatal. Of these, 70% are suicides while the remaining 30% are either accidental poisoning or exposure in the course of handling the deadly chemical. The majority of suicides occurs among workers in the cash crop estates and agricultural smallholders where paraquat is used widely and where the people are among the poorest communities in the country.

In a study on paraquat deaths in one of the Malaysian states, it was reported that there were "definite associations between paraquat poisoning and the easy availability of paraquat to the victims who either lived near estates or were relatives of estate workers." About 70% of the victims were between 11 and 30 years old.¹

- In September 1985, six persons (ages 17 to 53 years) died of paraquat poisoning within one week.

Sahabat Alam Malaysia



Pesticides being sold without restrictions in one of the pesticide shops in Malaysia.

- On March 11, 1986, a 13-year-old schoolboy died in a hospital a few days after he had ingested paraquat following a ragging session in school.

- A 19-year-old student who was very disappointed with his examination results took paraquat which he had bought from a shop. He died in the hospital.

- A housewife died on July 16, 1987 after taking a cup of paraquat.

- Between January and April 1988, eleven persons in the Kuala Muda District of Peninsular Malaysia died as a result of drinking paraquat. In 1987, 20 persons in the same district died in the same manner. Most were between 20 to 30 years old.

- In April 1988, three persons (ages 15, 18 and 21 years) died in the state of Negeri Sembilan after drinking paraquat.
- In February 1989, two cousins aged 10 and 11 died; paraquat was detected during a post-mortem.

These are just a handful of cases involving victims of paraquat poisoning. Despite such tragic incidents which occur in increasing numbers every year, the Ministry of Agriculture still allows paraquat to be used and sold freely in the country because it is "economical and effective." It has been registered by the Pesticides Board even though it is banned or severely restricted in a number of countries. It is clear that the dollar sign is ruling, with economics taking precedence over human lives.

In 1988, the Department of Agriculture revealed that 100% of estate workers, 87.4% of rice farmers, and 98% of vegetable growers who were interviewed used paraquat.² Of these, 58% handled the chemical daily. In the cash crop estates, especially oil palm and rubber estates, thousands of workers who mix or spray paraquat are consistently exposed to the chemical. They usually work without any protection. Protective gear, when provided, is inevitably unsuitable for local humid and hot weather conditions. Even so, the workers themselves are often made to pay for the gear. In most cases, protective clothing or rubber boots are dismissed as a high cost factor.

Furthermore, workers are not given proper instructions on paraquat use. The 1988 Department of Agriculture survey found that only 11% of the workers interviewed had been given training before handling paraquat, while 67% of the plantation management involved did not provide any protective clothing for their workers. It is not surprising that 64% of the workers reported symptoms of poisoning including giddiness, skin rash, nail damage, nasal bleeding, eye irritation, nausea and labored breathing.²

A 1984 WHO report stated that in Malaysian rubber plantations, exposure is likely to be greater than in most other situations.³ Weed control is required continuously for ten months of the year, and workers apply the herbicide during the entire working day, six days a week. The high temperature and humidity, together with the light clothing of the workers, increase the potential risk of dermal exposure. Harmful dermal effects were reported among sprayers who worked with bare feet and without protective clothes.

In a Sahabat Alam Malaysia (SAM) survey of 30 estates in the state of Delangor, it was found that workers normally stir vats of the deadly herbicide with their bare hands. Even if they are aware of the dangers, they often work in areas far from any source of water to wash off accidental spills. Such spills are common, since the sprayers, who are almost all women, have to carry spray equipment weighing up to 25 kilograms (kg) per load on their backs.

There is no system of periodical medical examination of workers to monitor the effects of paraquat exposure on their health. Those who complain to their estate management subsequently face considerable harassment. The indifference of management is to a large degree caused by the lack of government urgency and effective action.

Government Response

The registration of chemical pesticides in Malaysia is the responsibility of the Pesticides Board which was established in 1975. The Board is part of the Ministry of Agriculture which is predominantly concerned with productivity. Thus, while the Ministry of Health publicly expresses concern over the number of paraquat poisonings, the Ministry of Agriculture reiterates that it is the "cheapest and most effective" weedkiller in the market.

"While the Ministry of Health publicly expresses concern over the number of paraquat poisonings, the Ministry of Agriculture reiterates that it is the 'cheapest and most effective' weedkiller in the market."

In June 1985, the two Ministries met to discuss the possibility of either banning or controlling the sale of paraquat. The second option was taken even though the Deputy Health Minister himself had publicly called for a ban. Public outcry was also strong.

The continued use of paraquat in the light of so many deaths and even more injuries makes a mockery of the ex-

sistence of the Board as a regulatory body. SAM has repeatedly called for a ban on paraquat; there can be no compromises where human lives are being lost.

Little Gestures

Thus, although paraquat is recognized by the government as a deadly poison, there is no will to ban it. The little gestures taken every few years when a fresh spate of fatal poisonings occur are not enough. These gestures consist of added regulations under the Pesticide Act 1974.

"The increasing incidents of paraquat-related deaths and accidents demand a ban. Tinkering with notions of 'control' will not work."

It took seven years for the Licensing for Sale and Storage for Sale Rules to take effect in September 1988 (Peninsular Malaysia) and April 1989 (East Malaysia). These provide conditions for the storage and sale of eight pesticides that are considered to be highly toxic. Paraquat is one of them. However, the conditions are weak, weak.

One of the conditions requires paraquat to be kept separately from other pesticides under lock and key. This is highly inadequate since large quantities are available in the plantations.

The Rules also prohibit the sale of paraquat to anyone below 18 years old and require a record of each sale to be made in a register book. The latter can easily turn out to be a mere formality since there is no control over the end use of paraquat. A survey by SAM in April 1989 revealed that many shops still do not display the age limit sign. In any event, this does not prevent youngsters from having access to paraquat once it leaves the shop.

Another set of rules called the Highly Toxic Pesticides Regulations are still under consultation. These seek to control the use of paraquat and its mixtures with monocrotophos and calcium cyanide. There are obligations on em-

ployers to maintain records of paraquat use, provide for proper storage of paraquat, provide protective clothing, and conduct medical examinations. A fundamental flaw is that these do not take into account the use of paraquat by self-employed farmers.

A first draft was circulated a few years ago, and in February 1989 after continued calls, a second draft was released by the Pesticides Board for public comments. This is a much watered-down version, and it appears that compromises are being made against the interests of human health.

Such a position is unacceptable. The increasing incidents of paraquat-related deaths and accidents demand a ban. Tinkering with notions of "control" will not work. The enforcement of the existing and proposed regulations is dubious since there are numerous distribution points and extensive use with few officers to carry out effective monitoring. The Ministry of Agriculture itself has admitted from time to time that they lack the expertise and facilities to conduct comprehensive studies on the effects of widespread use of toxic pesticides. ■

The concern of the Ministry of Health is clearly rendered subservient to the Agriculture Ministry's short-term priority of crop production at low economic cost. It is undesirable, therefore, that pesticide control continues to be the responsibility of the Ministry of Agriculture.

Alternatives to Paraquat

According to Dr. Mohd Yusof Hussein, Associate Professor of Pest Management at the Plant Protection Department, Agricultural University of Malaysia, there are several non-chemical alternatives to paraquat:

1. **Crops can be mechanically weeded** by using a hoe, long slash-knife, sickle or motorized cutter. These implements are still being used on some smallholdings and plantations. They are especially practical for weeding around palm tree bases.

2. **Weeds can be physically killed.** Rice field weeds can be flooded. The general burning of an entire area or heating of selected weeds will be useful in some situations. Shade-sensitive weeds can be shaded. Mulching, the use of material resistant to decomposition for excluding light from reaching the soil, will suppress some weed populations.

3. **Biological control** through the use of insects and disease pathogens has been successfully practiced on a wide scale in several countries such as Thailand. The use of livestock animals to graze weeds in plantations is practical and multi-purpose. Research has been conducted in Malaysia but there is no implementation.

4. **The planting of leguminous cover crops** in between rows of young rubber trees or oil palm simultaneously provides nitrogen to the crop trees and suppresses weed growth.

It is clear that alternatives to paraquat exist. However, the multi-million dollar paraquat market in Malaysia strives on. Paraquat is already banned in Finland, Norway, Denmark, Portugal, and Sweden and severely restricted in Japan, the Philippines, and Turkey. It is the duty of the government to take firm steps to ban the chemical. Only then will the high toll of paraquat death and injuries cease. ■



Paraquat container in Malaysia; few may be able to read the label.

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For further details, please contact Chee Yohe Ling; Sahabat Alam Malaysia, 43 Salween Road; 10050 Penang, Malaysia.

Paraquat

By Mary O'Brien

"Paraquat is probably the most effective herbicide that exists right now on the Earth. It is also one of the world's worst poisons."

—Edward Block,
University of Florida
lung specialist¹

wide (i.e., in over 130 countries;²) its damage to humans is similarly worldwide. Paraquat is used for desiccation of cotton, potato vines, and other crops; for weed control in rubber and coffee plantations, rice paddies, industrial sites and rights-of-way, and among fruit trees, shade trees and ornamentals; for pasture renovation; and for aquatic weed control.³

Paraquat in the Human Body

Paraquat's acute toxicity is extreme: A dose of 3-5 g (approximately 3-5 ml, or less than a teaspoon) paraquat approximates the toxic dose (LD_{50}) of paraquat for an adult male.⁴ The most characteristic feature of human paraquat poisoning is death by lung failure within weeks of ingestion. This is because paraquat is actively concentrated in lung tissue where cells critical to oxygen exchange die and are replaced by connective tissue cells, causing death by suffocation.⁵

If very large doses of paraquat are ingested (as in suicides), death will occur within a few days from damage to several vital organs, including the brain, adrenals, liver, kidney, and lung.²

There is no antidote for paraquat poisoning, so that survival of a person who has ingested paraquat depends on the amount ingested and time to intensive medical measures to inactivate and eliminate the paraquat from the gut and blood.⁷ Paraquat cannot be removed from the lung. Severe paraquat poisoning has a uniformly fatal outcome.⁸

Since the toxicity of paraquat is not specific to particular species, but is determined solely by penetration into organisms, paraquat sales are world-

Mary O'Brien is staff scientist for Northwest Coalition for Alternatives to Pesticides and editor of the Journal of Pesticide Reform. Mary serves as a member of the Steering Committee for the North American region of Pesticide Action Network, International.

Northwest Coalition for Alternatives to Pesticides; P.O. Box 1393; Eugene, OR 97440; (503) 344-5044.

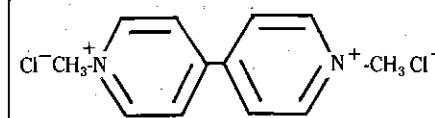
At very low levels of exposure, skin injury is evident: severe dermatitis, second degree burns, rash all over the body, discolored, red, and itching hands, and itching rash of face and neck.⁹ Premalignant skin lesions develop where skin exposed to paraquat is also exposed to sunlight.¹⁰

Paraquat and Protective Clothing

Given paraquat's extreme acute toxicity and potential for chronic toxicity, the necessity of extensive protective equipment renders callous the exporting of paraquat to hot southern countries where worker protection is minimal or nonexistent and the essential protective clothing is unbearable.

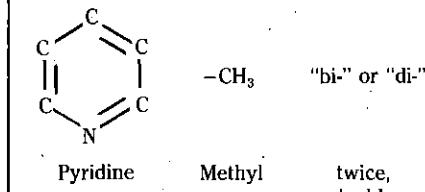
A California Department of Food and Agriculture (CDFA) report on paraquat poisonings of California workers during

Chemical Structure of Paraquat



Paraquat dichloride

I,1'-dimethyl-4,4'-bipyridinium dichloride
Note: In understanding the chemical name and structure of paraquat, the following will help:



Pyridine core Methyl group twice, double

1975 repeatedly notes each poisoned worker was not wearing some piece of protective equipment.⁹ One worker spilled paraquat on his legs and was poisoned: "The employee was wearing the proper visor, gloves, and boots, but he was not wearing coveralls to protect his legs."⁹

An employee was spraying paraquat on ditch banks with gloves which had a hole in them. During the operation the employee's gloves became dripping wet with the material. After 4 hours of exposure the worker developed an



Sahabat Alam Malaysia

Children mingling freely with empty paraquat containers, Malaysia.

ache in the joints of his hands. This was diagnosed as acute dermal poisoning.⁹

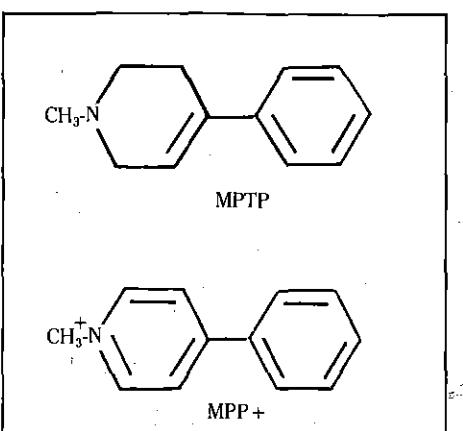
As the CDFA notes, "During mixing and loading of paraquat without a closed system, the worker shall wear a rubber apron, rubber gloves, a full face shield, rubber boot coverings, and a waterproof hat or helmet."⁹ Is this likely to be the protection a Malaysian plantation worker receives? Could the worker wear that clothing in high heat and humidity?

Paraquat and Parkinson's Disease?

Concern has been expressed that paraquat and related pyridine pesticides may be associated with Parkinson's disease, a disease of older adults involving progressive degeneration of certain nerve cells at the base of the brain and loss of voluntary movement (e.g., speech, swallowing, walking; JPR 5(3):29-30). The concern has arisen because a known inducer of parkinsonism, MPTP* and its metabolite MPP+, are chemically similar to paraquat,¹¹ and preliminary epidemiological findings in Quebec, Canada, indicate a correlation between incidence of Parkinson's disease and agricultural pesticide use.¹¹

It has been countered that paraquat is

accumulated differently than MPTP in the body and that there are no reports from animal or human studies of paraquat-induced parkinsonism.¹²



*MPTP: 1-methyl-4-phenyl-1,2,3-tetrahydropyridine

Paraquat in Smoke

A second concern has centered around the use of paraquat to destroy marijuana fields. Paraquat was sprayed in Mexico (using U.S. government funds) in the late 1970s, and spraying was proposed for U.S. marijuana eradication by the U.S. Drug Enforcement Agency in 1982.¹³ In March 1978, how-

ever, about 21 percent of marijuana samples that had been confiscated in 1976-77 in states adjacent to Mexico were found to be tainted with paraquat. Congress directed the Centers for Disease Control (CDC) to evaluate the public health significance of smoking such paraquat-contaminated marijuana.

The CDC report, issued in July 1983, indicated that, given the amount of paraquat found in confiscated marijuana samples, the smoking habits of marijuana smokers, and animal test data, some marijuana smokers in the U.S. would be exposed to an annual dose of 500 micrograms of inhaled paraquat and that this could produce lung damage. "We did not consider the possible additional pulmonary [lung] injury which might result from the inhalation of 4,4'-dipyridyl, the principal combustion product of paraquat and a compound which has recently been shown to be itself a pulmonary toxin," the CDC researchers reported.¹³

As lung injury by paraquat involves cell death, the damage is irreversible; the CDC therefore considered the presence of paraquat in marijuana to be a "health hazard."¹³ The spraying of U.S. marijuana with paraquat was halted in November, 1983.

Similar problems obviously apply to

the inhalation of any smoke contaminated with paraquat. The practice of burning paraquat-treated mint and grass seed fields to destroy straw and pathogens in the Willamette Valley of Oregon, for instance, poses the potential that residents exposed to the grass field smoke will inhale paraquat and paraquat combustion products as well as particulate matter and carcinogenic polynuclear aromatic hydrocarbons generated by the burning of the plant material itself (NCAP News 4(3):17-21).

Paraquat in the Soil

Literature on the environmental effects of paraquat points to indirect, longterm, and poorly examined effects as well as the more expected direct toxicity to living organisms.

Although paraquat itself is absorbed to clay particles in the soil, the paraquat degradate, QINA*, is, according to the U.S. Environmental Protection Agency (EPA), "very loosely adsorbed on the organic matter/clay complex [i.e., soil] and, therefore, has a potential for groundwater contamination."¹⁴

Paraquat that is bound to soil particles is minimally or not at all degraded and therefore remains in the soil. As Environmental Defense Fund toxicologist Ellen Silbergeld notes, this brings potential for further environmental contamination and human health damage.¹⁵

Absorption onto clay thus protects paraquat from breakdown and increases its environmental persistence; such adsorption further increases its mobility in the environment insofar as such small clay particles may be moved by atmospheric entrainment, precipitation, or surface water movement. Clay-paraquat complexes may be inhaled (and deposited deep in lungs if below 10 [micrometers] in diameter), ingested (e.g. through drinking contaminated water), or contacted directly; within the gut of most animals, proteolytic enzymes and acidic conditions may be expected to release paraquat, and similarly bound substances, from clay adsorption. Very small clay particles, if inhaled, may be directly taken up by alveolar macrophages [epithelial cells] within the lung and the paraquat dissolved into cellular material within these cells."

Paraquat and Terrestrial Animals

At doses lower than those used for weed control, paraquat kills honeybees (i.e., crop pollinators): "Total kill was shown by honeybees following [three hours'] contact with apple leaves sprayed [four hours] previously with [0.839%] paraquat."²²

Three of three samples of deer mice trapped in corn and soybean fields four to eight weeks after spring spraying with paraquat were found to contain metabolites of paraquat; liver damage was found in two out of three specimens.²¹ The researchers conclude, "[Paraquat] may have long-term effects on

wildlife under natural field conditions."

Highly toxic to bird embryos, paraquat was also found to result in increased mortality and reduced growth rates of American kestrel (*Falco sparverius*) nestlings at all doses (i.e., as low as 10 mg/kg) paraquat given in water.²³ Paraquat is therefore "considerably more toxic" to nestling American kestrels than had been previously reported for young birds of precocial species (i.e., those species such as northern bobwhite quail, ring-necked pheasants, and mallards whose young are relatively independent from birth). The kestrel is an altricial species: young are hatched in an immature and helpless condition, requiring extended parental care.

As the researchers note, "There are at least several food items of kestrels that could be readily contaminated by paraquat either by direct contact during agricultural spraying or by ingestion, including grasshoppers, small rodents, and passerine birds."²³

It is of interest that precocial bird

The Bright Side of Paraquat's Violence

It takes an Imperial Chemical Industries toxicologist to find the positive aspects of human suffering from paraquat. As Lewis Smith, head of ICI's Biochemical Toxicology Section notes, we've gotten to learn more about the human lung.

[From] the study of the mechanism of [paraquat] toxicity a greater understanding of pulmonary pharmacology and biochemistry has emerged. It has been possible to identify a polyamine uptake system in the lung that was hitherto unknown, and the biochemical consequences of the redox cycling of chemicals within cells have benefited from the use of paraquat as an experimental tool. Long after the toxicological, social, and economic consequences of paraquat are forgotten it is likely that some of the concepts that have emerged from its study will be remembered."

Smith, Lewis L. 1988. The toxicity of paraquat. *Adv. Drug React. Ac. Pois. Rev.* 1:1-17. Oxford University Press.

species (i.e., the bobwhite quail, ring-necked pheasant, and mallard duck) are the species accepted for bird toxicity tests for registration of paraquat by the EPA.²⁴ The EPA concludes from its indicator species data, "Wildlife populations should not be adversely affected when paraquat is used according to label directions."²⁴

Paraquat and Shady Deals

The history of paraquat registration in the United States has not been a smooth one. Eight of the animal toxicity tests supporting paraquat registration (i.e., "no unreasonable risk") were found to be invalid,²⁵ having been performed by Industrial Bio-Test Laboratories, whose testing and reporting procedures were found by a 1983 federal jury to be fraudulent.²⁶

In 1984, the EPA agreed to an out-of-court settlement with the Natural Resources Defense Council (NRDC), who had filed suit charging the EPA's decisions to continue licensing 13 suspect pesticides (including paraquat) had been the product of secret, illegal meetings with chemical manufacturers in 1981 and 1982.²⁷ As NRDC documented, "Following meetings with industry, a decision was made not to place paraquat into RPAR [a special review] over objections from responsible EPA officials that EPA had adopted industry scientific findings and insufficiently considered concerns over dermal [skin] exposure and lung disease."²⁸⁻²⁹

In 1984, Chevron Chemical Company indicated that distributors who want to sell paraquat under their own label must sign an agreement absolving Chevron of liability for death or injury to users.²⁹ Because of the growing number of multimillion-dollar lawsuits involving deaths and illnesses claimed to have been caused by paraquat, the distributor must provide liability insurance of "not less than \$1 million per person and not less than \$3 million per occurrence," to be paid for by the distributor.

In 1984 the U.S. Supreme Court let stand a federal jury award that Chevron was to pay the family of a Maryland man who died in 1982 from prolonged exposure to paraquat. Chevron claimed it wasn't liable because the paraquat container is marked as hazardous, but the jury and federal appeals court found that the label warned only of skin contact and not of lung ailments that could result from longterm exposure.³⁰

Paraquat: Priority for Bans

Paraquat was voluntarily withdrawn from the Norwegian market in 1981; Sweden banned paraquat in 1983 because of its high acute toxicity and irreversible effects; Finland followed in 1986 because of paraquat's high acute toxicity.³¹ In January 1989 the Netherlands banned paraquat because of its persistence in soil.³²

The use of paraquat is unnecessary anywhere; it is environmentally dangerous and a human poison everywhere. Its sale to southern countries is unconscionable. ■

"In January 1989 the Netherlands banned paraquat because of its persistence in soil."

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The Nicaraguan Approach to Pesticide Problems: A Model for International Non-governmental Organizations

By Douglas Murray

Pesticides cause major public health, environmental, and economic problems in the developing world. While the full extent of these problems is still undefined, recent investigations in the field of worker and community health indicate increasingly severe conditions. Early estimates of acute pesticide poisoning,¹ which significantly underestimated the extent of the problem, have given way to more detailed studies (albeit still imprecise),²⁻⁴ documenting pesticide-related illness patterns that rival or surpass many of the developing world's serious health problems, including tuberculosis, tetanus, and in some regions even malaria.

Gradual recognition of the severity of the problem is reflected in the emergence of an array of international policies and programs to address it. The World Bank and U.S. Agency of International Development (USAID), largely in response to pressure from the envi-

ronmental community, have developed guidelines and policies intended to control pesticide use in development programs (Michael Hansen's article, "The World Bank and Pesticides: Guidelines and Reality, p. 13). The Food and Agriculture Organization of the United Nations has developed a voluntary international code of conduct to address pesticide problems from distribution and use in the developing world. Even the pesticide industry has developed international programs to provide safety training, product labeling guidelines, and other measures to respond to the dangers associated with their products.

"[Most international efforts] have very limited presence or impact at the level where the problem is most acute: among the users of pesticides and the surrounding rural populations."

Douglas Murray is an independent consultant specializing in the management and reduction of pesticide hazards. From 1983 to 1988, Murray designed and implemented the Nicaraguan program described above. Correspondence may be directed to Douglas Murray, 3305 Hollywood Ave., Austin, TX 78722.

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than the host national and regional government ministries or international development agencies and programs. Increasingly within their own projects and service areas, these organizations are raising questions about pesticide hazards, safety, and alternatives. In some instances international NGOs, in collaboration with local organizations and/or host governments, have taken steps to address pesticide problems.

The Nicaragua Program: First Steps

The Pesticide Health and Safety Program in Nicaragua, a coalition of NGOs, appears to be the most elaborate effort to date and shows the promise, and limits, of pursuing the pesticide problem through international NGOs at the grassroots level. The program is an integrated group of projects that has evolved from initial volunteer efforts in 1983, to a region-wide program that includes several Nicaraguan government ministries, the largest farmworker and small-farmer organizations, several NGOs, and an array of funding sources. The latter include the government aid programs of Norway and Canada, CARE International, the American Friends Service Committee (AFSC), OXFAM Canada, and the Canadian Catholic Organization for Development and Peace. CARE Nicaragua provided the infrastructure and administration for the program, and in recent years, CARE International has provided the majority of the program's funding.

The program began with a series of field evaluations by U.S. volunteers in 1983 and 1984. A strategy based on these evaluations that combined immediate problem solving with ongoing monitoring and research measures was approved by the Nicaraguan government and financed by the NGOs. It focused on immediate worker health problems in the northwestern cotton-growing region of León, where pesti-

cide use was heaviest. Because the university and the Ministry of Agrarian Reform already had a fairly sophisticated Integrated Pest Management Program (IPM), the development of pesticide alternatives was left out of the initial strategy. Closed system mixing and loading equipment was installed at several large cotton farms where pesticides were routinely loaded into airplanes for application on the cotton fields.

Since these sites were the source of numerous poisonings and several fatalities each year, the closed systems were considered the best immediate means to reduce worker exposure. Closed systems use and general safety training were provided to workers on these farms and their supervisors. Volunteer physicians from the U.S. and Canada monitored health at these work sites by sampling whole blood cholinesterase⁵ and using a questionnaire on pesticide use and exposure.²

In the ensuing two years, 30 farms were equipped with closed systems, and the health monitoring activities expanded to include an annual surveillance of 5,000 workers and community residents and the development of a pesticide illness registry through the health clinics and hospitals of the region.

Both the monitoring and the use of closed systems were enthusiastically received by the Nicaraguan farmworkers organization and certain departments within the ministries of labor, health and agrarian reform. A regional commission composed of these ministries and organizations coordinated the pesticide program in collaboration with the NGOs. This commission was both an indication of the commitment of the Nicaraguans to the program, and a vehicle for assuring the permanence of the program and its eventual autonomy from international funders and support.

Military and Economic Priorities Intervene

But the escalating conflict on the Nicaraguan borders and within some regions of the country, as well as the increasing economic hardship related to the war, began to undermine the program as it grew into a region-wide effort. The pesticide program experienced frequent personnel turnover among health technicians, trainers, and inspectors who were drawn into the



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A young Nicaraguan pesticide applicator and his backpack sprayer.

military or higher priority programs, or who left for other countries to escape the draft or the economic hardships.

Even more serious was the turnover of workers trained in the use of closed systems and pesticide safety. At one point a survey found only five percent of the trained closed system operators still on the job by the middle of the cotton season.⁶ In addition, the crisis lent itself to the ever-present bias in the developing world (and much of the developed world as well) which prioritizes production needs over health. The limited resources and personnel were devoted to producing the crops, while trainers and safety equipment became increasingly scarce. A number of the closed systems had not been maintained

with replacement parts and were not providing protection to the workers.

Cara al Pueblo: A Plea for Commitment

Several events during this period significantly altered the direction and nature of the program. The first was a community meeting in León in the fall of 1986 called the Cara al Pueblo, a regular event in Nicaragua since the establishment of the new government in 1979. These meetings are similar to traditional town meetings in some parts of the U.S. in which community people meet with their elected representatives to air grievances about the effects of government programs and offer opinions about problems or new commu-

nity needs. The Nicaraguan president, Daniel Ortega Saavedra, and the heads of the regional government ministries, were in attendance.

During the meeting, a number of farmworkers complained that the Ministry of Agrarian Reform and the state and private farm managers and owners were not providing safety measures for workers exposed to pesticides. A discussion ensued in which the president tried to locate the source of the discontent and the obstacles to addressing the problem. Ministry of Health officials reported a high-level meeting between several of the regional ministry directors and representatives of the president's office the following day. Within the week, at the request of the regional government representatives, the NGOs and the regional ministries agreed between them to assure better cooperation between local and international organizations, and, more importantly, greater commitments of personnel and materials to the pesticide problem.

"A discussion ensued in which [Daniel Ortega] tried to locate the source of the discontent and the obstacles to addressing the problem."

campesino farmers, was experiencing poisoning rates equal to or greater than the workers on the large cotton farms. The Nicaraguan agrarian reform was successfully helping many thousands of rural subsistence and domestic market producers modernize their small plots. But in so doing, it was inadvertently creating greater health problems among this same group by giving them financing for new inputs, namely pesticides.

Shifting to Decentralization

The NGOs decided to shift the focus of the pesticide program away from the almost exclusive emphasis on working through the existing institutional structures and began to develop activities through the more decentralized and less developed worker, small farmer, and rural community structures. This decision to shift emphasis was facilitated by apparent improvement in the cooperation of the Ministry of Agrarian Reform subsequent to the Cara al Pueblo. Replacement parts for the closed systems were arriving on the farms and major purchases of safety equipment were made.

"The weakness [of the early Nicaraguan program] was the over-reliance of the NGOs and the pesticide program on working with and through government ministries whose bureaucracies posed general obstacles."

ones where necessary. These committees are now being considered for other activities by the local organizations and the regional ministries. They have potential both for more effective delivery of social services, such as improving the health monitoring services, and for more direct expression of worker, farmer, and community concerns and needs.

Moving Toward Alternatives

During the same period the program also began experimenting with non-chemical pest control strategies (e.g., rearing insect viruses that can be substituted for chemical pest control agents), as a means to reduce pesticide use and hazards. The potential of the participatory training structure for wide dissemination of new practices, combined with the realization that the government/university programs were focused almost entirely upon large-scale farming, particularly cotton, led program personnel to reevaluate the original decision not to pursue integrated pest management (IPM) or nonchemical alternatives. The experiments have progressed slowly, in part due to the highly technical nature of the methods and the need for significant additional infrastructure and funding.

In contrast to the standard approach to training, however, these sessions were highly participatory, drawing upon the participants' experiences and concern over the problem.

More importantly, the training encouraged the participants to organize health and safety committees by selecting several people from among their group before the end of the two- to three-day training session. These committees provided follow-up evaluations of the initial training and worked with the program extensionists to design further training sessions to address persistent problems or issues that were not resolved in the initial training.

The training approach used existing farmworker, community, or small farmer organizational structures where they existed, or helped organize new

The farmworker action in the Cara al Pueblo demonstrated both a weakness in the existing program and an opportunity. The weakness was the over-reliance of the NGOs and the pesticide program on working with and through government ministries whose bureaucracies posed general obstacles. The opportunity was relatively obvious. The farmworker organization was clearly committed to addressing the pesticide problem and apparently quite capable of sustaining pressure upon government and private institutions for resolutions to it.

At about the same time, the illness registry system and health monitoring surveillance project generated their initial evaluation of the previous years' data.² It showed that an additional sector of the workforce, the small

against the hard reality of the economics of development programs. In spite of its successes, the program was still delving into approaches that were not widely practiced. The NGOs had limited resources, and the major international funding sources were not yet ready to commit resources to this unusual endeavor. By 1988 only the Nicaraguan government, CARE, and the AFSC were still committing new funds to the program. One-time contributions were obtained from other government and non-government sources, but the funding was becoming increasingly erratic.

At the same time, Nicaraguan organizations and government institutions began pressuring for expansion of the program activities into other regions of the country where pesticide problems were also serious. Without significant new resources, tensions arose both between various regional government ministries and between the NGOs and their Nicaraguan counterparts, over whether to maintain the program personnel and resources in one region, thereby assuring the on-going success of the regional effort, or to share these resources with other regions at the risk of weakening the program in its original region.

"Finally in early 1989 the Norwegian government informed CARE that it would provide significant new funding to the program for a minimum of three years."

The program spent the latter part of 1987 and all of 1988 trying, with inadequate funding, to meet these increasing demands. The result was a gradual erosion in local support, some decline in the quality of certain program activities, and the loss of both local and international personnel. The program appeared destined for the fate of many development programs: unfulfilled expectations and an untimely ending due to inadequate financial support.

Norwegian Support for the Nicaraguan Model

Finally in early 1989 the Norwegian



Nicaraguan children bathing in a pesticide barrel.

Douglas Murray

government informed CARE Norway that it would provide significant funding to the program for a minimum of three years. With this commitment of funding, CARE AFSC, and the Nicaraguan government have initiated the design of an expanded program that will draw upon the previous training and health-monitoring successes, and develop an integrated strategy to promote sustainable agricultural practices to reduce reliance upon pesticides in conjunction with controlling pesticide hazards. The new direction of the program should be watched closely by the NGO community because it offers a potential model for other countries to follow.

Conclusion

The Nicaraguan experience suggests that grassroots collaborative efforts to address pesticide problems can be a viable development approach. The program's strength has been its ability to have an immediate impact on the problem while maintaining a longer term investigative and monitoring role. Monitoring, while not generally associated with development programs, is essential to success in adapting to the changing nature of pesticide hazards and problems.

Two other related factors contributed to the success of the Nicaragua program: the degree of local participation and control, stemming from the training/organizing project; and the program's flexibility, its ability to move from a closed system, large cotton-farm focus to one that incorporated rural training and organizing among farm-workers and campesino farmers. Similar NGO efforts in other parts of the world should emulate this flexibility and local empowering.

The main obstacle that remains for this approach to pesticide problem solving is the difficulty of finding funds. If one considers the amount of resources that have been dedicated to other health problems, most notably malaria, and further considers the tremendous amount of resources that continue to go into development strategies that promote the use of pesticides, it should be apparent that major new funding sources must be created if developing countries are going to respond effectively to the problem. If such resources are made available, the pursuit of the pesticide problem through NGOs and grassroots-oriented programming should provide exciting opportunities for problem solving and more viable agricultural development strategies.

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Mission No Longer Impossible: Researching Pesticide Producers

By Sandra Marquardt

While the following article focuses on United States sources of information regarding chemical corporations and their products, citizens of other countries may wish to obtain this information either by a direct request (e.g., through the Freedom of Information Act, accessible to citizens worldwide), or indirectly through a non-governmental organization in the United States.

-Ed.

Your Mission should you choose to accept it:

A company located in your vicinity is manufacturing a pesticide. What it is, what kind of an effect its production is having on the public health and environment of the surrounding community, you do not know. But you are not afraid to ask.

Slowly the public is gaining access to pesticide storage and toxicity information in the United States. This information should play a vital role in decision-making efforts concerning everything from zoning for roads and residential areas, to identifying water contamination concerns.

Getting the necessary information, however, is generally a slow and often unrewarding process. For example, critical toxicity tests often have not been completed or are not even required. Furthermore, dissemination of information to the public is contrary to the old way of doing business and is not always done willingly.

As part of its North American Inland Waters Expedition during the summer of 1988, Greenpeace's Pesticides Campaign used several different sources of information to prepare reports on two

Sandra Marquardt is the Pesticide Information Coordinator for Greenpeace Action. A copy of the Velsicol report is available for \$5 from Greenpeace.

Greenpeace, 1436 V Street, NW, Washington, DC 20009; (202) 462-1177.

pesticide producers located along the Mississippi River: Monsanto Corporation and Velsicol Chemical Corporation. What publicly available sources of information did Greenpeace consider using?

Toxicity Data

Many of the pesticides on the U.S. market have had to undergo a "re-registration" review or a "Special Review" at the U.S. Environmental Protection Agency (EPA). For these, the Agency has "Registration Standards" or "Special Review" documents that provide a general overview of short and longterm health effects data available on the product.

"Unfortunately, there are so many gaps in the EPA pesticide data bases that you may not be much more knowledgeable about a product's hazards after reading [EPA] documents than before."

EPA also has fact sheets on those pesticides undergoing re-registration. Unfortunately, there are so many data gaps in the EPA pesticide data bases that you may not be much more knowledgeable about a product's hazards after reading these documents than before.

You can request from EPA copies of "Tox One-liners" for pesticides. These consist of very short (literally one line) reviews of each short- and longterm toxicology study submitted by manufacturers to EPA in support of product registration.

You may want to contact EPA's "Pesticide Hotline," otherwise known as the National Pesticides Telecommunications Network at Texas Tech University Health Sciences Center; School of

Medicine; Lubbock, TX 79430; (800) 858-7378 or (806) 743-3098. Staffers at this hotline can conduct searches and provide basic information on the potential health and environmental effects of a particular product, as well as names of other organizations that have useful information.

Computer data bases are often available at universities or through lawyers and other researchers. These are very expensive, so you should work with someone already familiar with them. Data bases such as "Medline" and "Toxline" provide references to toxicological studies published on particular chemicals.

"Lexis/Nexis" provides access to a litany of documents with legal significance, including notices in the *Federal Register*, legal opinions from all federal and state courts, and well-organized background information as well as names of experts in agencies and organizations who can provide you with further information.

Environmental Effects Data:

A discussion of some potential environmental effects of particular pesticides often is provided in Registration Standards and Special Review documents (see "Toxicity Data" above).

Information on the precise or potential extent of environmental effects on local areas can sometimes be gleaned from journal articles and literature reviews in books.

To determine what the company is discharging into your environment, you may want to use information required under both the Clean Water Act and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), more commonly known as Superfund.

Under the Clean Water Act, companies discharging their waste into navigable waters are required to obtain National Pollutant Discharge Elimination System (NPDES) permits. These permits list the names of particular chemicals and the exact limits of the amounts the company is allowed to discharge. To get a copy of a company's

NPDES permit, contact your state environmental regulatory agency, (probably called the Department of Environmental Conservation, Natural Resources, Environmental Quality, or Environmental Protection) or the regional Environmental Protection Agency (Regional offices are in Boston, New York, Philadelphia, Atlanta, Chicago, Dallas, Kansas City, Denver, San Francisco and Seattle.)

Take a look at the company's Permit Application. With this application, the company must submit the results of a "Priority Pollutant" scan of its discharge. (The 126 Priority Pollutants are listed under 40 *Code of Federal Regulations (CFR)* Par. 401.15 of the Clean Water Act.) Thus, you can find out not only what products are being discharged that do have regulatory limits, but also which chemicals are coming out in the wash *without* limits.

To compare the levels "permitted" in regulations against those that are actually discharged, ask the environmental agency to send you the company's "Discharge Monitoring Report" for a particular period. (Companies must submit them on a monthly basis.) These reports allow you to see whether the company is within its regulatory constraints.

"To compare the levels [of pollution discharge] 'permitted' in regulations against those that are actually discharged, ask the [state] environmental agency to send you the company's [monthly] Discharge Monitoring Report."

Some of the most useful site-specific information is slowly becoming available under the 1986-enacted Superfund Amendment Reauthorization Act (SARA) Title III, also known as the Emergency Planning and Community Right-to-Know Act (JPR 9(1): 9-11). Because of these provisions, the public now has access to information previously kept well within the company's gates.

Facilities storing large quantities of

hazardous chemicals as well as manufacturers using large amounts of toxic chemicals must report the presence of these products under Title III, allowing for increased community awareness.

Facilities storing large quantities of hazardous chemicals as well as manufacturers using large amounts of toxic chemicals must report the presence of these products under Title III, allowing for increased community awareness.

Specifically, companies using, manufacturing, or processing hazardous chemicals covered by Title III are now required by the Act to supply a variety of information to EPA and Local Emergency Planning Committees (LEPCs), usually on an annual basis. These data include: Material Safety Data Sheets (MSDS), listing safety information and a brief analysis of the toxicity of particular products; Chemical Inventory Forms (amounts of particular chemicals stored onsite, due every March 1), Toxic Chemical Release Forms (often referred to as Form Rs, containing information on the amounts of chemicals used and released into the air, ground, water and general environment, as well as the names of offsite operators accepting the waste for disposal in their landfills and incinerators, due every July 1); and an Emergency Response Plan, including evacuation routes (due October 1, 1988).

While extremely useful, the reporting categories are large and vague and only those hazardous chemicals for which reporting is required are covered. Nonetheless, the information has formed the basis of a number of reports written by groups across the country, and has served as the basis for policy-setting concerning zoning regulations.

Now That You Know What You Need, Where and How Do You Get It?

MSDSs:

First of all, if you don't know already, you need to find out both the common and scientific names of the product(s) of concern. Contact the company (using the address on a product label, the phone book or other sources such as the *Farm Chemicals Handbook*) and request a copy of its annual report (if it is a publicly-held corporation) and/or the "Material Safety Data Sheet" (MSDS) for each of its products. A MSDS is a form which the Occupational Safety and Health Administration (OSHA) requires be filled out by producers of particular

Four Non-Governmental Sources of Pesticide Information in the United States.

Pesticide reform, toxicology, alternatives:

National Coalition Against the Misuse of Pesticides (NCAMP)
530 7th Street, SE
Washington, DC 20003
(202) 543-5450

Northwest Coalition for Alternatives to Pesticides
P.O. Box 1393
Eugene, OR 97440
(503) 344-5044

Information on alternatives to pesticide use, integrated pest management:

Bio-Integral Resource Center
P.O. Box 7414
Berkeley, CA 94707

Information on hazardous wastes, community organizing:

Citizen's Clearinghouse for Hazardous Wastes
P.O. Box 926
Arlington, VA 22216
(703) 276-7070

hazardous chemicals, including pesticides, covered by OSHA's Hazard Communication Standard (40 *Code of Federal Regulations* Part 1910.1200). The scientific name of the product will give leading information in its own right.

While the depth of information varies by company, the forms often contain warning statements and precautionary measures, product occupational control procedures, emergency and first aid procedures, fire protection information, and spill, leak, and disposal information. Sometimes, companies also include brief summaries of health effect and environmental studies conducted on their particular products. Those can be useful when researching a product that is produced, though not registered for use in the U.S., since EPA information on such products is usually nonexistent.

Should all else fail, all pesticide production facilities, even those producing pesticides for export only, must register with the U.S. Environmental Protection Agency (EPA). Use the Freedom of Information process (see below) to get a list of producers and the sites. (For unregistered pesticides, toxicity information is not required to be submitted to EPA for review, making research into the product's toxicity much more difficult.)

Once you have a general idea of what the products are, go to your local, state, or university library and work with the librarian to look up articles, studies, and reports concerning the products (see above for computer data base discussion). This may help you cut short your research time, by giving you names of contacts, toxicity information, and other related information.

Getting in-depth human and environmental toxicity data is a little more difficult. You should be able to ask the contacts you have found whether you can come to their office to browse through the files on a particular company to look for (and possibly copy) notices of infractions, or proposed plans, or if they can send particular documents to you. However, since most officials are overworked, or the necessary information is in a variety of different departments, they will probably suggest that you use the Freedom of Information process.

Freedom of Information

• Write to the Freedom of Information office of the state, regional, or national EPA, since that is the agency in charge of pesticide product registration and the Superfund programs. Under the Freedom of Information Act (FOIA), the public (including citizens in foreign countries) has access to a variety of non-confidential documents, ranging from internal memoranda to agency assessments concerning the product. You can even ask for copies of the tests manufacturers have had to provide to EPA, although you must first sign a document swearing that you are not a competing multinational corporation that could use this information to obtain pesticide registration in other countries. Be aware that in some cases large sections of the studies are extensively blacked out for "confidentiality" reasons.

To go through EPA's FOIA process, write to: EPA Information Officer; Freedom of Information Office, A-101; Hotlines:

401 M St., SW; Washington, DC 20460. While the Agency must acknowledge your request within ten working days, you may not actually receive the requested information for months, or even years, because of agency backlog and the time it takes for finding different documents and obtaining clearance. This delay time should be taken into consideration in planning the time your research may take. If you need the information quickly, include in your request a statement to that effect, and check in periodically with the FOI office.

Hotline (800) 535-0202, or (202) 479-2449. This is a good source of information on how to get the right information concerning how to use the SARA Title III system, how to get involved in the SARA Title III process (perhaps even volunteering), whom to contact in your area, and any other SARA-related questions. For example, the Hotline has a listing of all the State Emergency Response Commissions across the country and can help you locate the closest, or most pertinent, Local Emergency Planning Committee.

To get a free copy of EPA's "Title III List of Lists" (document number EPA 560/4-88-003) containing a list of chemicals for which reporting under Title III is required, or a copy of "Chemicals in Your Community—a Citizen's Guide to Title III," write to the Title III Document Distribution Center; P.O. Box 12505; Cincinnati, OH 45212.

• EPA has two other Hotlines you may want to contact. One is the RCRA (Resource Conservation and Recovery Act)/Superfund Hotline at (800) 424-9346 or (202) 382-3000. This hotline has information on solid and hazardous waste regulations, Superfund site descriptions, or general questions. The other hotline is the Safe Drinking Water (SDWA) Hotline at (800) 426-4791 or (202) 382-5533. The SDWA hotline has information on drinking water standards, regulations, and general information.

Citizen Sources

• For more information on how to use information available to you through SARA when doing a company profile, request a copy of "A Citizen's Waste Audit Manual," from Greenpeace; 1017 W. Jackson; Chicago, IL 60607; (312) 666-3305. Call for publication cost. You might also want to contact the following three groups: the Working Group on Community Right-to-Know, c/o Environmental Policy Institute, 218 D St., SE; Washington, DC 20003; Gerry Poje, National Wildlife Federation; 1400 16th St., NW; Washington, DC 20036; or Debby Shiman, NRDC; 1350 New York Ave., NW; Washington, DC 20005.

• Contact nonprofit local and national organizations active on the issue of pesticide use and alternatives. These organizations often have in-depth information on the products you are interested in, including studies, articles, lawsuit briefs and other legal materials, as well as good contacts (see box).

"Under the Freedom of Information Act, the public (including citizen in foreign countries) has access to a variety of non-confidential documents, ranging from internal memoranda to agency assessments concerning the product."

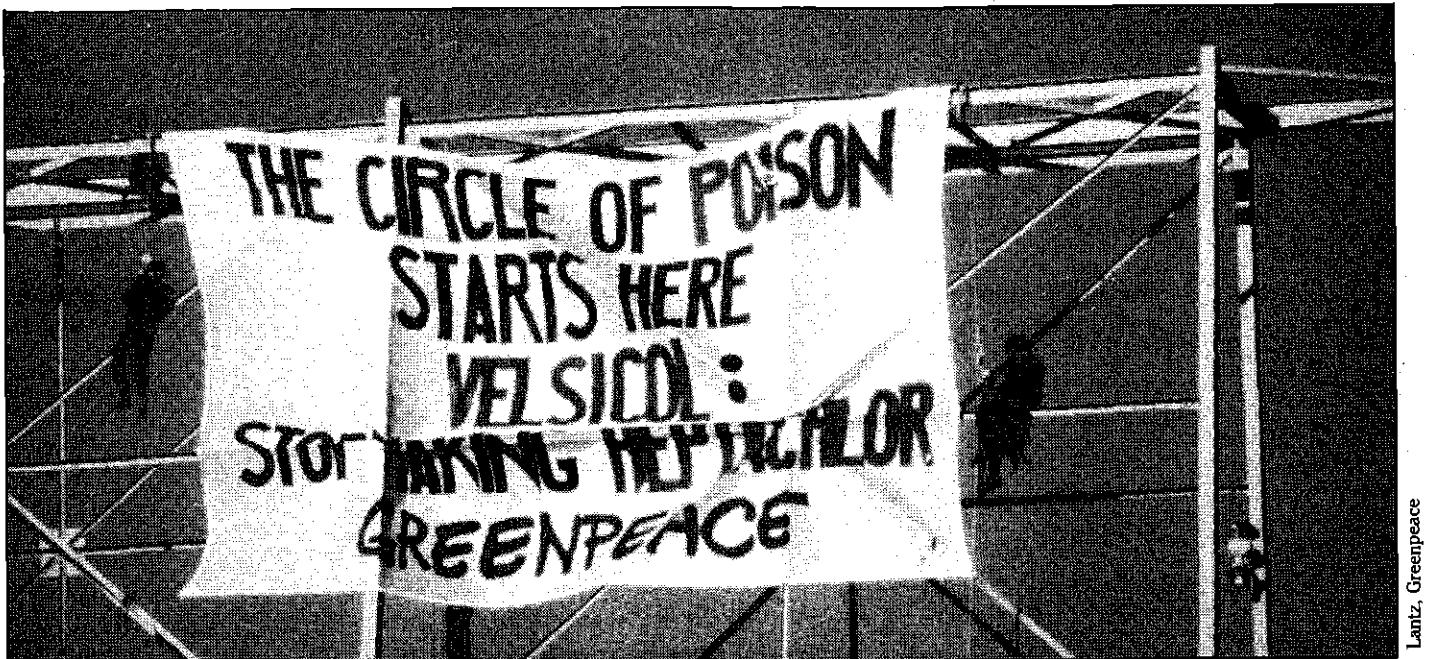
While you may have to pay for the cost of photocopying or searching for documents, you shouldn't have to pay anything if the amount comes to less than \$25 and fees are generally waived completely for nonprofit groups. Ask in your FOIA request for a waiver of fees if "the information is in the public interest because furnishing the information can be considered as primarily benefiting the public." In this case, add a brief description of how you intend to use the information.

NTIS and EPA Information:

• Contact the National Technical Information Service (NTIS) for information on a specific product. NTIS acts as a clearinghouse for EPA's public information—at a cost. It can be reached by calling (703) 487-4650, or writing NTIS; 52385 Port Royal Rd.; Springfield, VA 22161.

Hotlines:

• Contact EPA's Superfund Amendments and Reauthorization Act (SARA)



Greenpeace banner denounces Velsicol practices at Velsicol facility, Memphis, TN.

Case Study: Velsicol Chemical Company and SARA Title III Right-to-Know Information

During our 1988 North American Inland Waters Expedition down the Mississippi River, Greenpeace developed several reports on target polluters, relying on all of the above sources, particularly Title III materials provided to us by the LEPCs. In one report, we focused on Velsicol Chemical Corporation in Memphis, TN, sole manufacturer of several products, among them the insecticide heptachlor, a product not allowed to be produced for use in the U.S., yet produced in the U.S. for export only, primarily to southern countries.

From the Form R, we are able to discern that in 1987, Velsicol's plant discharged more than 660,000 pounds of toxic chemicals into the air (point and nonpoint, or "fugitive" emissions), including almost 600,000 pounds of carbon tetrachloride, 1,230 pounds of chlordane, and 1,786 pounds of heptachlor. Form R data, plus state government data, showed that the plant sent approximately 17,000 pounds of pesticides and other chemicals to the local sewage plant for disposal either into its unlined landfill or into the Mississippi River.

What was not incinerated onsite or sent to the local sewage facility and landfill (following pre-treatment) was shipped to Environmental Services in Baton Rouge, LA; GSX Chemicals Ser-

vices in Pinewood, SC; and Enesco in El Dorado, AR. Stored at the facility were somewhere between 100,000 and 999,999 pounds each of chlordane, heptachlor, carbon tetrachloride, and hexachlorocyclopentadiene (which, at a maximum, could have added up to between 1 million and 9,999,999 million pounds), as well as other products.

Information provided to the Local Emergency Planning Committee demonstrated that approximately 3,140 people in the immediate quarter mile area (in this case, employees of business and industry) could be affected in the case of an accident. Maps indicated the location of other potentially affected parties.

Of particular note is that, despite the good intentions of the law, reports from the companies to the LEPCs show that companies are not always quick to report leaks or accidents to the appropriate authorities. For example, according to a Velsicol report to the LEPC, on March 14, 1988 the company waited more than a day (27.5 hours) to inform the LEPC of a tank's 6-12 pound release of hexachlorocyclopentadiene into the air, although an accidental release of more than one pound of the substance warrants "immediate response."

Conclusion

While the gates to information are not yet wide open, great strides have been made toward gaining increased

Velsicol's Chlordane/Heptachlor Export Market

- Argentina
- Australia
- Belgium
- Brazil
- Colombia
- Costa Rica
- Dominican Republic
- French West Indies
- Finland
- Guatemala
- India
- Indonesia
- Israel
- Ivory Coast
- Malaysia
- Netherlands
- Pakistan
- Philippines
- Republic of South Africa
- Singapore
- Thailand
- Trinidad

Major importers

public access to important data. Although companies resent this slow unveiling, they should recognize that it is in their best interest to work with concerned citizens who are gathering data.

Pictures for Pesticides: A Critique of the FAO/GIFAP Scheme

By Peter Gore

One of many factors contributing to the countless pesticide poisonings that occur throughout the world and particularly in southern countries is the inability of users to understand the messages printed on pesticide labels. (Of course, this presumes the label is present, which it frequently is not, given local transfers of pesticides to unmarked bags, bottles, and other containers.)

One response to this problem that doesn't reduce the use of pesticides is to place warning pictograms on the labels (see illustration) in addition to the usual printed information. The United Nations Food and Agriculture Organization (FAO) and GIFAP, the international trade association of agrochemical manufacturers, have recently prepared a set of 12 illustrations that they urge governments to require manufacturers to place on labels of pesticides sold in their countries (i.e., "Regulate us; we won't necessarily place pictograms on the labels otherwise").

A joint GIFAP-FAO task force reviewed previous pictographic systems for agrochemicals, prepared three different systems, and then distributed 3,000 questionnaires worldwide to "farmers and farm workers."¹ With nearly 1,000 questionnaires from 42 countries returned, the task force worked on altering the preferred scheme according to some suggestions.

GIFAP has now published a brochure, "Pictograms for Agrochemical Labels,"² that contains art work for each pictogram and a brief explanation of design specifications, placement and use.

Two of the pictograms, the storage pictogram and the wash-after-use advice pictogram, are intended for all labels; use of the others depends on the pesticide.

Peter Gore is a professor of environmental science in the Center for Earth and Environmental Science at State University of New York; Plattsburgh, New York 12901; (518) 564-4038.

quate protection while using pesticides.

Wear Mask

This also is a culturally biased symbol because of the hair and facial features. Furthermore, it recommends a bad practice by suggesting the use of a cloth type surgical mask. By using a cloth mask, the person spraying the pesticide risks getting the mask wet with the pesticide mist, and then being continually dermally exposed. Also, the mask may not properly block inhalation of the pesticide mist.

Wash After Using

This symbol recommends a bad practice by suggesting that a person applying pesticides should wash up afterwards in a basin. This is dangerous because the pesticide being washed off is collected in the basin water, and redistributed to any part of the body that comes into contact with the water, effectively defeating the purpose of washing in the first place.

Toxic To Animals

The symbol of farm animals is adequate. However, the border and slash to signify prohibition are incorrect according to the standards of both the U.S. Department of Transportation and the European International Road Sign System.

In Europe, a slash going from NE to SW (or 2 o'clock to 7 o'clock) means "resume activity" or "go ahead", as when resuming driving speed upon leaving a village. A circle with a slash going from NW to SE (or 11 o'clock to 5 o'clock) is the international symbol of prohibition.

The U.S. Department of Transportation also uses this international symbol.

Toxic To Fish

The representation of the fish is adequate, but the water over the fish appears to be a flag waving in the wind. The border and slash to signify prohibition are also incorrect according to the practices of the U.S. Dept. of Transportation and the European road sign system.

▪ NEWS FROM THE NORTHWEST ▪

Whatever symbols are adopted, a written message should always accompany them so that the symbols do not become a guessing game. Every time the symbols are viewed with the message attached, their message is reinforced and the illustration itself serves as a miniature training program.

References

1. Deutsch, AE. 1988. Pictograms urged for agro-

- chemical labels. *International plant protection center info letter*, No. 68, August.
2. GIFAP. 1988. *Pictograms for agrochemical labels*. Available free from GIFAP/Pic; 70a Ave. Alber Lancaster; B-1180 Brussels; Belgium; or from: FAO, Via delle Terme di Caracalla; 00100 Rome; Italy.

Pesticide Label Pictograms¹

Storage

^aKeep locked away and out of reach of children

Activity

^bHandling liquid concentrate

^cHandling dry concentrate

Application

Advice

^eWear gloves

^fWear eye protection

^gWash after use

^hWear boots

ⁱWear protection over nose and mouth

^jWear respirator

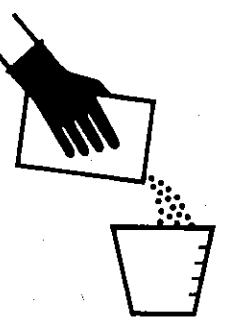
Warning

^kDangerous/harmful to animals

^lDangerous/harmful to fish—do not contaminate lakes, rivers, ponds or streams



a

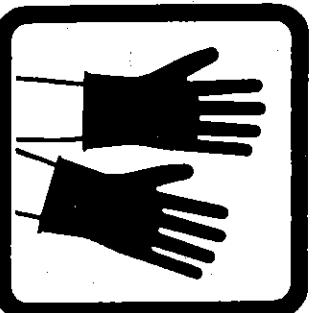


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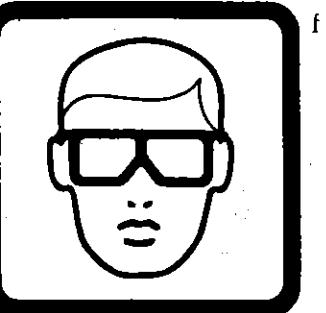


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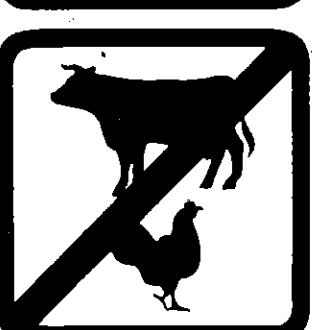
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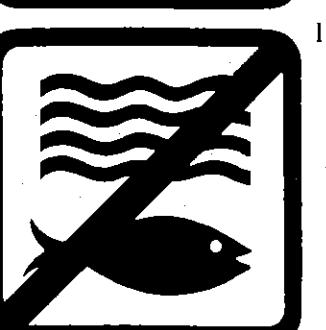
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¹GIFAP. 1988. *Pictograms for Agrochemical Labels*.

On the Road Again: Pesticide Spills on Idaho Highways

Use of pesticides on roadsides is a hazard being addressed in many states (see "Weed Buster . . .," p. 46), but the transport of pesticides on these same roads is not. In 1986, taking steps to address the transport of pesticides and other hazardous materials within the state, Idaho enacted its Hazardous Material/Hazardous Waste Transportation Enforcement Act.¹

Marking the first final action under the law, the state of Idaho reached an out-of-court settlement on an April 1987 pesticide spill near Montpelier, Idaho.² The suit was brought under provisions of the 1986 law allowing the state to assess civil penalties for violations of the law and to cover the costs of responding to and cleaning up an accident.

On April 25, 1987, a truck carrying the nitrophenolic herbicide dinoseb stopped at a cafe on U.S. Highway 30 near Montpelier, Idaho. The herbicide was found to be leaking out of several 5-gallon cans on board the truck.³ One of the truck's two drivers came in contact with the herbicide while righting some of the cans and was treated for the exposure at Bear Lake Memorial Hospital in Montpelier. The cafe, the motel where the truck stopped for the night, and the Idaho Highway Department lot where the truck was impounded were cleaned up by CENEX Chemical Warehouse. The cleanup of the 25 gallon herbicide spill was overseen by officials from the local district health department and the U.S. Environmental Protection Agency.⁴

In August, 1987, the state of Idaho filed suit against the trucking company involved, ACB Trucking Co. of North Little Rock, Arkansas, seeking \$7,000 to cover the cost of cleaning up the herbicide spill and another \$30,000 in penalties. Attorney General Jim Jones pointed out that company officials had been notified that the truck was leaking the herbicide when it was in Laramie, Wyoming, but still told the driver to "keep on truckin'.⁵

The Department of Law Enforcement and the Attorney General's office an-

brought under a provision of the law which allows the state to assess costs for "compensation of damages to publicly held resources including but not limited to land, water, recreational uses, wildlife, fish and aquatic life to restore the resource to its highest immediately previous uses."⁶ The state is claiming approximately \$375,000 for the cost of restoring the lost fish and lost recreational value of the Little Salmon River.¹⁰

Attorney General Jones notes, "This [ACB Trucking] case should send the message that improper handling of hazardous wastes and materials on our highways is not going to be tolerated. When hazardous cargoes are transported in Idaho, those responsible will have to pay damages and response costs when a spill occurs."⁵

-Brett A. Fisher

1. Hazardous Materials/Hazardous Waste Transportation Enforcement Act, Idaho Code 49-2201 *et seq.*
2. *State of Idaho v. ACB Trucking* (D.C., Bear Lake County, ID) No. 3652.
3. "Herbicide Leaks from Truck; Cafe Closes," *The Idaho Statesman*, Boise, ID, April 25, 1987.
4. "Herbicide Contaminates Cafe, Trucker," *The Post-Register*, Idaho Falls, ID, April 26, 1987.
5. "Idaho to Sue Truck Company for Dinoseb Spill in Montpelier," *The Idaho Statesman*, Boise, ID, August 7, 1987.
6. Mitchell, Ed. "Chemical Cleanup Ends, Aides Meet," *Minidoka County News*, Rupert, OR, April 24, 1985.
7. Horsman, Dave, "Spill Victims Sent to Rupert Hospital," *South Idaho Press*, Burley, ID.
8. *State of Idaho v. Southern Refrigerator Transport*.
9. Idaho Code 49-2209 (2)(d).
10. Personal communication, State of Idaho, Attorney General's Office, June 19, 1989.



■ NEWS FROM THE NORTHWEST ■

■ RESEARCH ■

Birds of a Feather Die Together with Organophosphates

Citizen claims and wildlife agency suggestions that bird die-offs often occur after normal agricultural use of pesticides are often brushed off for lack of "proof" that chemicals were the culprits. Now comes the proof with a recent study whose first author is Lawrence J. Blus, a U.S. Fish and Wildlife Service researcher. The study found that use of two organophosphates (dimethoate on alfalfa and methamidophos on potatoes) in southeastern Idaho adversely affected populations of sage grouse.

Sage grouse are migratory and move to summer range in southeastern Idaho during June. Cropland makes up a large part of their summer range and grouse use of cropland increases sharply during extended periods of extremely hot and dry weather. Although spraying of crops in this area of Idaho begins in late spring, the study noted that most applications occur in July and August at the height of cropland use by sage grouse.

Blus initiated the study after the Idaho Department of Fish and Game discovered sage grouse numbers were declining significantly in eastern Idaho.¹ The researchers placed radio collars on sage grouse and monitored their survival after the grouse entered alfalfa and potato fields in the Mud Lake, Camas, Montview and Hamer areas. The cause of grouse fatalities was determined through cholinesterase assays of the grouse's brains and residue analysis of the grouse's crop

contents.

The researchers found that of 82 grouse radio-collared in July 1985 and 1986, 18% subsequently occupied fields at the time they were sprayed with dimethoate or methamidophos and of these, 5% and 16% died from organophosphate poisoning in 1985 and 1986, respectively. In addition, of 200 sage grouse present in an alfalfa field sprayed with dimethoate, 63 were later found dead, 43 clearly because of the pesticide. In 1986, 20 of 31 intoxicated grouse (grouse exhibiting acute symptoms of exposure to organophosphates) that were radio-collared after being found in dimethoate sprayed alfalfa died.

The researchers suggest that use of the minimal recommended application

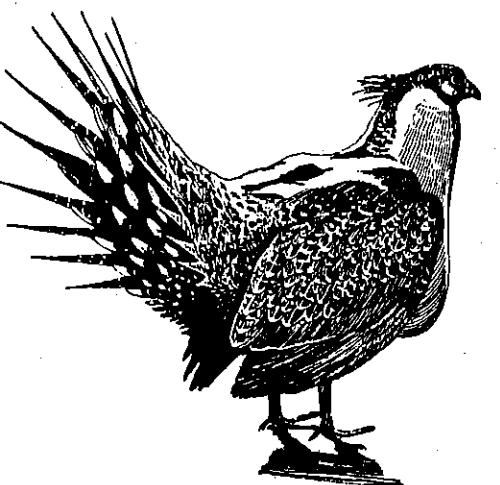
rates of pesticides and use of wildlife repellants may reduce the hazard to grouse. However, die-offs of sage grouse and other species of birds including ring-necked pheasants and grey partridge from pesticide applications are possible throughout much of their range in Idaho and in other states where cropland is available.

Blus concludes, "Our study provides evidence for claims that pesticides are at least partially responsible for declining populations of upland game birds in the United States and Europe."²

—Brett A. Fisher

1. Stuebner, Stephen, and Mike Harrop. "Study: Insecticides Killed Sage Grouse," *The Idaho Statesman*, April 23, 1989.

2. Blus, Lawrence J., Chris S. Staley, Charles J. Henny, Grey W. Pendleton, Tim H. Craig, Erica H. Craig and Douglas K. Halford. "Effects of organophosphorous insecticides on sage grouse in southeastern Idaho." *Wildlife Management*: In press.



■ CITIZEN ACTION ■

The Japanese Beetle and the Oregon Chemical Mentality

The stage has been set, and the same tired, old scenario is being played out again: another ill-advised, state-conducted pest eradication effort, this time for Japanese beetle (*Popillia japonica*). The Oregon Department of Agriculture (ODA) is using the same old script that agencies always use to argue for chemical warfare against all individuals of an

insect species, with no real consideration given to biological control, no-action alternatives, the health risks to exposed residents, or the ultimate success of the program.

The Japanese beetle is not a major pest in its native Japan where it is under natural biological control, but the beetle has flourished in the eastern

part of the U.S. where natural predators are lacking. Milky spore disease has been used successfully for control in the U.S. for many years, and newer research has isolated several nematodes that are quite effective,¹ but the beetle has not been eradicated through these means, or through the use of pesticides.

Good travelers, adult Japanese beetles are often found in cargo holds of aircraft flights originating in east coast airports. Beetle grubs can be carried in soil trapped around the roots of plants

brought by people moving from east coast states. It is predictable that the beetles will continue to find their way out west with travelers.

In three separate episodes, small, isolated populations of Japanese beetle have been found and ostensibly "eradicated" in California communities through massive chemical onslaughts in residential areas (see "The Individual and State Spraying" JPR 4(3):2-5). These eradications, as usual, were not casualty-free. Seventy-one people reported illnesses related to carbaryl spraying in Orangevale, CA³ and secondary pest outbreaks occurred as natural predators were killed and the natural ecological balance was upset.⁴

Now the beetle has arrived in Oregon. After trapping 28 Japanese beetles in a residential area of Tigard, OR in 1988, the ODA initiated a one square mile intensive spray program using the carbamate insecticide carbaryl (Sevin) for adult beetles, and the organophosphate diazinon for beetle grubs. Most of the 56 households in the area granted permission for ODA to conduct treatments in their yards last year, after ODA warned of dire consequences to Oregon's nursery and orchard industry if the beetle population were allowed to become established.

However, many residents were surprised when, after six applications of highly toxic chemicals to their yards, the ODA was back in 1989 seeking permission for further pesticide applications. This time, ODA used the carbamate bendiocarb (Turcam) for grub treatments, and proposed to spray carbaryl every two to three weeks throughout the summer in case any adult beetles hatched.

After hearing of these plans, several residents became sceptical, both of the need for more treatments and the purported safety of the pesticides being used. Approximately 20% of the residents refused to grant permission for the Turcam application, and several of them turned to NCAP for information about the pesticides being used and possible alternatives for control of the Japanese beetle.

Several residents then hand delivered an informational packet to the neighborhood, describing the hazards of carbaryl and Turcam and possible biological and other alternatives for controlling the beetle. More than 90% of the resi-

■ NEWS FROM THE NORTHWEST ■

dents signed a petition to the ODA requesting a public hearing and public input into the beetle eradication program.

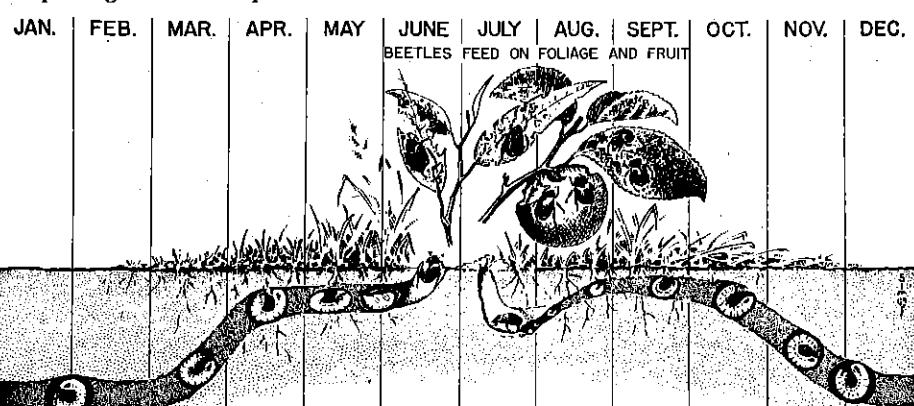
By the time ODA held an "informational" meeting to placate residents' fears about the program and warn them of the dire consequences of not treating with toxic pesticides, the residents were well-informed and asking hard questions.

The residents grew predictably more hostile after ODA dismissed most of the biological alternatives and stated that the only problem with using toxic pesticides in residential areas was the public "perception" that the chemicals were hazardous.

In response to the petition and to residents' reactions, the agency has scheduled another meeting, with ODA Director Bruce Andrews. Residents will propose that a citizen's advisory panel study the situation and help work out a broadly acceptable solution. Meanwhile, ODA has stated that no spraying will occur without further citizen input and airing of concerns, and certainly not before late June trapping to see whether adult beetles are found.

So far the state has not resorted to forced spraying in Tigard, but also has not ruled out the possibility if no mutually agreeable compromise is reached.

- 1. Wright, R.J. et al. 1988. Steinernematid and Heterorhabditid nematodes for control of larval European chafer and Japanese beetles in potted yew. *J. Econ. Entomol.* 81 (1):152-157.
- 2. Sheltar, DJ et al. 1988. Irrigation and use of entomogenous nematodes *Neoplectana* spp. and *Heterorhabditis heliothidis* for control of Japanese beetle grubs in turfgrass. *J. Econ. Entomol.* 81:1318-1322.
- 3. Kurtz, Peter. California Department of Food and Agriculture, Worker Health and Safety Division. Primary symptomatology for all reported cases of human illness attributed to pesticide application during the Japanese beetle eradication program in 1983. [Exhibit 29 in *County of Santa Cruz v. CDFA* (1985)].
- 4. DeBach, Paul, and Mike Rose. July, 1977. Environmental upsets caused by chemical eradication. *Calif. Agric.* (University of California), pp. 8-11.



and environmental costs. Even if it is found by a court to be compelling, the state may be under a duty to use the least-toxic alternative.

Given the lack of large scale research and field test data on most biological controls, it is often impossible to locate conclusive evidence that biocontrols can eradicate or provide effective control of particular insect species in a particular setting.

Advocates of chemical pesticides, however, also rarely have conclusive evidence on the efficacy (and certainly not on the safety) of the chemical program they propose. It is important to put the burden of proof on those who would use toxic chemicals to show their pesticides can accomplish the job effectively without serious side effects.

In the case of Tigard, residents have pointed out that if the pesticides are so effective, why have seven applications not accomplished the job? Why is ODA now proposing more applications every two weeks over the summer, to continue next year, if more than one beetle is found this year? Neither the track record nor the future of the chemical program is impressive. —Becky Riley

■ NEWS FROM AROUND ■

■ HERE, THERE, EVERYWHERE ■

Warning! Are You Insured Against Damage Caused by a Pesticide Applicator?

The following warning is contained in a leaflet printed by the New York Department of Environmental Conservation. Such a warning may need to be published by your group or state if your state allows pesticide applicators to carry liability insurance with a pollution exclusion clause. Such a clause removes insurance company responsibility for personal or property damages caused to you by a pesticide applicator. Your own property insurance may have a pollution exclusion clause as well.

—Ed.

Are you planning to have pesticides used on your house, lawn or other property? Before hiring a pesticide applicator, make sure what protection the firm's liability insurance offers you.

Recent changes in liability insurance coverage have resulted in the addition or revision of *pollution exclusion* clauses in most policies available to the pesticide applicators. This exclusion may remove any responsibility by the insurance carrier for personal or prop-

erty damages which may result from the pesticide used, including sudden or accidental releases or misapplications.

Ask your applicator . . .

- What kind and how much coverage is provided for personal injury to you, your family and others—outside of the applicator's employees—from the handling or use of pesticides, including



accidents and misapplications?

- What kind and how much coverage is provided for property damage, other than that belonging to the applicator, from the use of pesticides, including accidents and misapplications?

Insurance Provisions . . .

Current [New York] pesticide control regulations require that a pesticide applicator business carry a minimum liability insurance of \$100,000 per individual and \$300,000 per incident for bodily injury, and \$50,000 for property damage.

However, a *pollution exclusion* clause may severely limit the protection such policies offer you by excluding risks associated with pesticides. The pesticide regulations *do not* prevent insurance companies from adding such a clause to liability insurance policies.

You should also check with your own insurance company to determine what, if any, protection your property insurance provides in the event of personal injury or property damage resulting from the application or misapplication of pesticides.

—New York

Department of
Environmental Conservation

■ PESTICIDE TALES ■

If You Use Dicofol, the Mail Might Not Come

The U.S. Postal Service has stopped mail delivery on two routes in Palm Beach, Florida, after three employees became ill, apparently due to exposure to dicofol.¹ Suspension of postal services became effective March 22, 1989.

Postmaster Thomas Poore said he and two others experienced nausea, headaches, and skin rashes after delivering mail in the citrus growing region. One mail carrier was hospitalized in October, 1988, after being sprayed by a crop-duster working on Callery-Judge Company citrus groves. According to a Florida agriculture department spokesperson, dicofol's toxicity is not high.

The EPA temporarily cancelled registration of dicofol in September, 1986, because the insecticide's DDT levels were too high; the U.S. manufacturer failed to provide the EPA with data showing that DDT levels could be decreased below 2.5% in 1986.²

The EPA has since set a new, lower standard for DDT levels in dicofol at 0.10%. According to Dennis Edwards,

cotton, and other crops. The pesticide previously gained notoriety because it is suspected of being one source of increasing DDT levels in lizards and birds in the Southwest (JPR 6(2):36).

DDT, banned as an active pesticide ingredient in 1972, is a contaminant of dicofol.

The EPA temporarily cancelled registration of dicofol in September, 1986, because the insecticide's DDT levels were too high; the U.S. manufacturer failed to provide the EPA with data showing that DDT levels could be decreased below 2.5% in 1986.²

Dicofol, sold under brand names such as Kelthane, is widely used on citrus,

EPA's project manager for dicofol registration, the current standard is acceptable to EPA because "dicofol is made from the same ingredients as DDT, and from a chemist's standpoint it is not possible to reduce DDT levels any further."²

Rohm and Haas, the sole U.S. manufacturer, submitted new data to the EPA in August 1987, showing that their insecticide conforms to the 0.10% standard for DDT, and the EPA re-registered the product. An Israeli chemical company is the only competitor to Rohm and Haas for the dicofol consumer. There are no efforts currently underway to review dicofol's registration.

—Ron McMullen

1. "Because of pesticides." Sarasota Herald/Tribune, March 24, 1989.

2. Personal communication, Dennis Edwards with Ron McMullen, May 15, 1989.

■ NEWS FROM AROUND ■

■ CITIZEN ACTION ■

NCAMP seed Grant Proposals: Send Yours in Now

The National Coalition Against the Misuse of Pesticides (NCAMP) is awarding seed grants of up to \$2,000 under its Community Organizing Project. The purpose of the project is to strengthen the effectiveness and long-term viability of local community-based groups working to control pesticide use and promote alternatives.

NCAMP wants to fund small, fledgling organizations with their seed grants, not well-established groups that have developed their own funding base. The total amount available for this year's seed grant project is \$10,000.

Funding in previous years has included such projects as documentation of a community pesticide problem, inventories of community pesticide use, analysis of state and national issues and their relevancy to the community development of media outreach, and coalition building.

Some of the limitations on entrants are that they be groups, not individuals, and have a total organizational budget of no more than \$40,000. Groups that are not tax-exempt 501 (c)(3) organizations are encouraged to apply; however, only tax-exempt activities can be

funded through the seed grant program. Thus, lobbying activities on specific legislation cannot be subsidized.

The deadline for proposals is September 1, 1989.

For more information contact Sarah Sullivan; NCAMP; 530 7th St. S.E.; Washington D.C. 20003; or call (202) 543-5450. —National Coalition Against the Misuse of Pesticides



ed States] efforts to protect endangered species which migrate from one country to another." The core population of the *Aplomado falcon* lives in Mexico.

The final recommendation of the committee was that land owners should be compensated if pesticides are restricted and viable economic alternatives are not available.

The committee members included representatives from the Southmost Soil and Water Conservation District, Laguna Atascosa Wildlife Refuge, Cameron County Environmental Review Board, Mobay (a pesticide manufacturer), Texas Department of Agriculture, Cameron County Extension, and Texas Parks and Wildlife Department. A cotton grower and a vegetable producer were also on the committee.

These recommendations are part of a nationwide process to bring EPA pesticide regulations in compliance with the Endangered Species Act. They appear to be a compelling example of the difficulties that face government agencies trying to protect endangered species without committing the necessary resources to development of pesticide alternatives.

—Caroline Cox

Letter (undated) from the Cameron County Agriculture and Wildlife Pesticide Co-existence Committee to EPA Office of Pesticide Programs; 401 M St. SW, Washington D.C. 20463.

■ NEWS FROM AROUND ■

■ INTERNATIONAL ■

A New Trap for Tsetse Fly Control in Africa

Researchers at Kenya's International Center for Insect Physiology and Ecology (ICIPE) have developed a trap for the tsetse fly (*Glossina*) that has the potential to be an efficient, low-cost control measure. The traps consist of blue cloth tents, baited with soil soaked with cape buffalo urine.

Research has shown that the tsetse fly is attracted to the color blue and the phenolic glycosides that concentrate in the urine when it is processed by soil microbes. Once attracted inside the traps, the flies fly upward toward daylight shining through a small hole in the top of the tent; they are caught in a small plastic bag attached to the hole and killed by the sun's heat. Tsetse flies have long been considered pests because they carry a trypanosome parasite that causes sleeping sickness in humans and the nagana disease in other mammals.¹

ICIPE plans to teach local residents how to build, bait, and tend the traps. Earlier control attempts included burning large acreages of forests, killing thousands of large mammals to deprive the flies of their food source, and large scale pesticide applications. ICIPE

director Thomas Odhiambo characterizes these past efforts as "... destructive, causing negative long-term ecological consequences." The traps promise to be both less damaging and more effective.¹

Tsetse fly control is a long-term African dilemma. While the flies cause 20,000 cases of sleeping sickness every year and restrict cattle raising in 38 African countries, they have also, by keeping cattle away, preserved precious habitat for Africa's native grazing mammals which carry the parasites but do not become ill.

"Eliminate the tsetse and cattle will invade," in the words of Willie van Niekerk, a guide in a Botswana wildlife refuge, "and cattle are the despoilers of Africa, bulldozing the continent into one big wasteland."² —Caroline Cox

1. Hiltz, Philip. 1989. "A better flytrap for Africa." *The Washington Post National Weekly Edition*, April 17-23.

2. Gerster, Georg. 1986. "Tsetse: Fly of the deadly sleep." *National Geographic* 170(6):814-432.

■ ALTERNATIVES ■

Weed Buster: Dumb Name, Great Roadside Program

By 1986, Tama County, Iowa faced significant roadside vegetation management problems. Despite broadcast spraying of roadside vegetation with herbicides and fuel oil on the county's 640 miles of roads, weed control was declining. Landowners and farm operators were lodging complaints about drift and ineffective weed control. They were also concerned about herbicide application rates and the effect on water quality.¹

To deal with the noxious weed problems (Tama County doesn't have many roadside drainage problems), Tama County Supervisors first developed a set of goals. These were to improve weed control, reduce herbicide use, reduce complaints, and lower the roadside vegetation budget of \$110,000. The next step was a meeting between the supervisors, weed commissioner, county engineer, county auditor, and extension agriculturist to develop a

pilot project to achieve the goals.

The pilot project, called Weed-Buster, was enacted in 1987. It combined herbicide spraying with manual control. Nineteen of the county's 21 townships (a township is 36 square miles) were sprayed as usual, primarily with 2,4-D. The cost of spraying was \$125 per double-ditch mile. The other two townships were hand-weeded by 4H clubs on a contract basis for \$30 a double-ditch mile. The extension service provided group training to the 4H clubs in noxious weed control and safety. There was a reduction in herbicide use, but the results were not satisfactory.

The participants in the 1987 project, the extension crop specialist, and a soil, waste, and water management specialist reviewed the 1987 program, and suggested changes. The problems included the difficulty of training people to recognize the difference between desirable and undesirable vegetation, a

labor shortage when hand weeding would be most effective, high overhead costs for coordinating hand weeding, continued spraying of most of the county, and failure to adequately control the most proliferous noxious weeds, Canadian thistle and musk thistle.

The 1988 noxious weed program was significantly changed and expanded. Integrated vegetation management (IVM) techniques were adopted, such as scouting for specific weeds, concentrating efforts on Canadian thistle and musk thistle, mapping noxious weed infestations in areas that were being hand-weeded, spot treating problem areas and those that were hand weeded in 1987, moving herbicide applications to late May and early June (two weeks) from late June, July, and August (ten weeks), and reducing the number of townships sprayed from 19 to four per year.

Tama County quit using fuel oil with herbicides and employed only certified applicators for spraying. In addition, a

■ NEWS FROM AROUND ■

test plot was established to test different herbicides and application rates in an effort to reduce reliance on 2,4-D. The test plot would serve as a demonstration project for the public, the Weed-Buster committee, herbicide applicators, and scouts.

The results of the 1988 program were impressive. Herbicide use was reduced by 90% and fuel oil was no longer mixed with the herbicides. Consequently, money spent on herbicides dropped from \$45,000 per year to less than \$5,000. Reducing the application period, application rates, and the total area sprayed, coupled with comparatively lower costs for scouting, mapping, and hand weeding (about \$17 per double-ditch mile in 1988) as opposed to spraying (\$125 per double ditch mile) netted \$15,000 in labor savings.

Another benefit of not spending the money on herbicides, according to Extension Agriculturist David Quinlan,² was that the majority of the vegetation management budget that would have transferred funds to chemical companies out of state was instead spent within the county, which helped the depressed farm economy. Quinlan reported that the extensive hand weed-

ing, scouting, mapping, and spot treating in 1987 and 1988 yielded further reductions in herbicide use this year;³ the 1989 herbicide budget is \$3,000.

Other successes of the 1988 program were realized. Complaints about spray drift were reduced from ten to twelve per year to zero, thistle control was improved by 70%, selective spot treating of broadleaf weeds allowed native grasses to compete more effectively on roadsides, and wildlife habitat was increased and improved.

Others See the Light

In addition, six other Iowa counties have initiated vegetation management programs that are similar to Weed-Buster this year. Inquiries about Weed-Buster have increased dramatically from counties in Iowa and on the West Coast.

Reflecting on the Tama County program, Quinlan said he doubts that it would have even gotten off the ground were it not for passage of the 1987 Iowa Groundwater Protection Act (JPR 7(3): 5-6). Passage of the landmark groundwater legislation entailed a massive education effort to change people's consciousness about the effects of pesti-

cides in the environment, and passage of the bill increased demands for changes in Tama County's vegetation management program.

One of the greatest difficulties in making Weed-Buster successful has been changing people's cultural views of what desirable roadsides look like. Pointing out that roadsides which look like golf courses require massive inputs of herbicides that have far-reaching environmental impacts helps change people's views of the kinds of roadsides that are desirable when herbicides have already become suspect to them. Public education will continue to be a part of the Tama County Vegetation management program.

Analyses of Weed-Buster's first three years can be obtained by writing to David Quinlan, Tama County Extension Director, Cooperative Extension Service, PO Box 308, Toledo, IA 52342.

—Ron McMullen

1. Quinlan, David J. 1988. Success story: Weed-Buster (Roadside vegetation control). Toledo, IA: Cooperative Extension Service.

2. Personal communication, David Quinlan with Ron McMullen, May 15, 1989.

3. Personal Communication, David Quinlan with Ron McMullen, May 22, 1989.

■ PESTICIDE TALES ■

Canada's Ban on Alachlor Receives Court Blessing

On December 6, 1988, after a three-year legal fight, a Canadian Federal Court of Appeal upheld an Agriculture Canada ban on the cancer-causing herbicide alachlor. The manufacturer of alachlor, Monsanto Canada Inc., immediately applied for leave to appeal the decision to the Supreme Court of Canada, but on May 4, 1989, the Supreme Court dismissed the appeal. Alachlor therefore remains banned in Canada.

Intervenors against Monsanto and on the behalf of the Minister of Agriculture, John Wise, included Friends of the Earth, Pollution Probe, and farmer Zulma Van Englen. Van Englen's farm well water had been contaminated with alachlor in 1985.

In the Appeal court hearing, Monsanto challenged the Minister's right to exercise his discretion under federal law, when, in January 1988, he rejected a

review board's recommendation that he lift a 1985 ban on alachlor. Monsanto wanted to force the government to accept the board's recommendation that alachlor's registration be reinstated. On December 6, 1988, a three-judge panel of the Federal Court of Appeal unanimously rejected all of Monsanto's arguments and upheld the ban.

The evidence of alachlor's carcinogenicity was fully supported by Health and Welfare scientists, including Dr. Len Ritter, who said, "I know of no chemical with which I have been involved where the evidence has been more convincing."

Evidence notwithstanding, Monsanto promptly applied for leave to challenge the Minister's decision in the Supreme Court of Canada.

"Most likely Monsanto [continued] to fight the Canadian ban so vigorously for fear of a 'domino effect' in other coun-

tries rather than for the small value of their Canadian sales," says Friends of the Earth's Julia Langer. With concerns about pesticide use growing worldwide, Canada's decision may lead other governments to question alachlor's safety and help protect people in other countries from this herbicide.

—Jaki Woge

■ NEWS FROM AROUND ■

■ INTERNATIONAL ■

Infoterra: Environmental Information for the World

Accurate answers to complex environmental questions are available throughout the world by mail or telephone through Infoterra, the United Nations Environment Programme's (UNEP) international environmental information system.

Infoterra is a network of 134 national focal points and 110 participating international organizations. In 1979, its first year of operation, Infoterra handled 3,200 queries; in 1988, it answered more than 14,000.¹

*A list of focal points can be obtained from UNEP; New York, NY 10017; USA.



■ INTERNATIONAL ■

A Tale of Two Seas: Contaminants at the Top of the Food Chain

Studies show that toxins in the Mediterranean and Labrador Seas are accumulating in humans and animals at the top of the food chain as they consume large amounts of other organisms that are slightly and moderately contaminated.

Polychlorinated biphenyls (PCBs), believed to originate in the Soviet Union, Europe and parts of Asia, are contaminating most seals upon which

many Inuit depend. Some seals show traces of pesticides, including DDT, and radioactive cesium. Walrus, narwhal, caribou, polar bear and Arctic char, also an integral part of the Inuit diet, are affected as well.¹

After four years of extensive federal testing on Broughton Island, Northwest Territories, Canadian scientists told the Inuit that while the Inuit's country foods are contaminated, there's no

United Nations office within a country can act as a switchboard directing queries to the Infoterra network.²

Linda Spencer, Infoterra-U.S. information specialist at the U.S. EPA in Washington, DC, notes that she receives scores of phone calls and 100-125 letters a month, but less than 10 percent are from the U.S. Most queries, about 60 percent, are from less industrialized countries, and four out of five of them want information on chemicals, and pesticides in particular.¹

As an example of the information available, Infoterra-U.S. has access to the U.S. EPA library of more than 11,000 journals and 337,000 monographs and can also refer to its extensive microfiche collection of government reports, laws, environmental proceedings and articles.

Infoterra-U.S. has access to hundreds of U.S. databases, which in turn provide access to newspapers and journals worldwide, as well as specialized information on environmental regulations, hazardous wastes, chemicals, health hazards, and energy and agriculture.¹

Infoterra-U.S. can be contacted at PM 211-A; EPA Headquarters Library; 401 M St. SW; Washington, DC 20460; phone (202) 382-5917. —Brett Fisher

1. UNEP North America News, reprint, 1989.
2. Linda Spencer, personal communication, June 22, 1989.

these contaminants. For example a number of fishermen in the Tyrrhenian Sea area who ingested high amounts of mercury will have to be monitored for any signs of minamata disease, a fatal condition.

The Cory's Shearwater, an open ocean bird that depends on marine organisms, has been found to pick up a substantial amount of contaminants on a seasonal basis in several areas of the Mediterranean Sea.

The toxins found in eggs and tissues of these sea birds include mercury, cadmium, PCBs, hexachlorobenzene, toxaphene, lindane, and aldrin. The last five named generally come under the category loosely called chlorinated hydrocarbons which are often used in agriculture as pesticides or in industry.

Shearwater eggs from the Mediterranean showed PCB values ranging from 2 to 25 times higher than values of eggs from the Atlantic. Contamination of the Cory's shearwater as well as the seal is linked to their main diet of fish.²

Though some European organizations are stimulating renewed interest

■ NEWS FROM AROUND ■

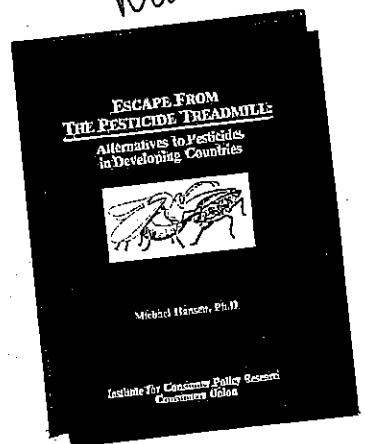


on the state of the Mediterranean Sea, the most alarming fact to scientists of both the Labrador and Mediterranean Seas as well as Inuit leaders is that no one knows the ecological and long-term health consequences of the PCBs or the other contaminants. Despite the uncertain outlook, many Inuits say they will continue to eat their traditional foods and Mediterranean fisherpeople will still fish.

—Jaki Woge

1. Sakardi, Laurie. "Toxin-Laden Food Inuit Dilemma" Toronto Star,
2. Wainaina, Sam. 1989. "State of the Mediterranean basin." *Ecoforum* 13(5):13, 15.

■ REVIEWS ■



Escape from the Pesticide Treadmill: Alternatives to Pesticides in Developing Countries

Michael Hansen. 1987. Institute for Consumer Policy Research, Consumers Union of the United States, Inc.; 265 Washington Street; Mount Vernon, NY 10553. 185 pp. \$12.00.

Escape from the Pesticide Treadmill is a collection of six case studies which

- The brown planthopper, now considered the most serious rice pest in Asia, devastated early "green revolution" varieties of rice. New hopper strains attacked the first three pest resistant rice varieties developed, and also became resistant to commonly used insecticides. Laboratory studies showed that a number of insecticides actually stimulated the hoppers to lay

"The development of the NPV [nuclear polyhedrosis virus attacking the velvetbean caterpillar] as an insecticide holds great promise as a non-toxic control that can be manufactured relatively cheaply and used at the farm level—which makes it an ideal control measure."

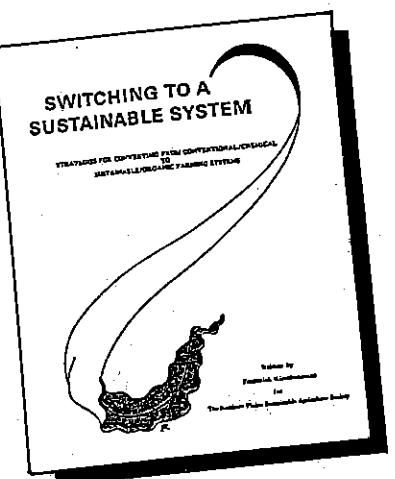
■ REVIEWS ■

more eggs. An IPM program for rice farmers in the Philippines, using improved resistant varieties and pest monitoring to determine when insecticides were necessary, maintained rice yields while cutting pest control costs by 50% and reducing insecticide use by 80%.

A baculovirus has successfully controlled the rhinoceros beetle, a pest of coconut palms in the South Pacific. Early attempts to stop the spread of the beetle using a quarantine based on the use of chemical insecticides failed, but continued support for research allowed scientists to isolate, test, and spread the virus to beetle populations in many South Pacific nations.

"Unfortunately, little information on pest control alternatives is available to those who need it most: farmers and policy makers," Hansen writes in the book's introduction. He has done an excellent job of filling this need

—Caroline Cox



Switching to a Sustainable System

Fred Kirschenmann. 1988. The Northern Plains Sustainable Agriculture Society; RR. 1, Box 73; Windsor, ND 58424. 18 pages. Free.

Written by a farmer for farmers, this short, easy-to-read booklet is densely packed with principles, strategies, and examples for converting from conventional/chemical to sustainable/organic

farming systems. While much of the information is based on experience in North Dakota, the systematic approach and reliance on principles make it widely applicable. The practical approach and realistic assessment of risks involved make it especially useful for farmers.

In Part I, outlining the benefits of sustainable agriculture, Kirschenmann starts off by frankly discussing some of the disadvantages of making the switch, pointing out that this is not a way to get out of immediate financial difficulties, it is not just a way to stop using chemicals, and it requires its own set of start-up and on-going costs. The problems with meeting quality requirements and serving shifting specialty markets are realistically pointed out. Conversely, the advantages of diversity of production and pricing, resistance to crop stress, soil building, conservation, and health considerations are also pointed out.

Then, in the second part, we get to the heart of the matter: how to get started. The four objectives to be achieved during the transition period are the development of fertility-building rotations, manure management systems, cultivation systems, and pest control systems. The tools for developing these systems are discussed. The first and most important is the crop rotation system.

This booklet could also be titled "The Crop Rotation Handbook," as most of the emphasis is on practical ways of designing specific rotations for a particular farm. It starts by asking the reader to assess the crop from the standpoint of marketability, suitability for soil types, moisture, and climate, availability of equipment, and on-farm feed needs.

Eight principles of crop rotation design are discussed: (1) Plan for weed control by alternating between hot and cold weather plants, including natural germination inhibitors, legumes, cultivated crops, and perennial control; (2) provide for a diversity of nutrient uptake; (3) balance crop production and soil building; (4) include crops that penetrate soil compaction zones; (5) use rotations that provide for effective insect and disease control; (6) alternate high and moderate water-demanding crops; (7) diversify to increase stability of marketing; and (8) avoid build-up of undesirable soil elements.

Another necessary tool is imagination. In addition to conventional skills, farmers practicing sustainable agriculture need to change, cooperate with nature, develop self-confidence in their own professional skill and judgment, and most important, become skilled at imagining creative possibilities on one's own farm.

The last tool is time or patience. It takes time not only to revitalize the soil, but also to find out what strategies work on your farm. Kirschenmann says normally it takes five to ten years to put a good sustainable system in place on the average farm.

Developing a conversion plan for a specific farm includes assessing the individual farm's resources and weaknesses, developing a model crop rotation plan, and then creating and implementing a specific field plan starting with the best fields, staying small, choosing the lowest risk crops, and assessing results as you go.

The last part of the booklet on specific model rotations actually in use is the most interesting part of the book. Readers are cautioned to use them as guidelines only, but they demonstrate specific possibilities in enough detail that they stimulate creativity and thinking about one's own place.

While not as large as many similar efforts such as those by Earthcare and the Land Stewardship Project, this booklet feels like something more useful to a farmer planning overall strategies.

—Richard Thielges

Answers to "Pesticide Non-Trivia Quiz," editorial page.

1. one quarter
2. \$7.0 billion
3. two-thirds
4. Herbicides
5. 1.0 billion
6. 2.7 billion
7. four percent
8. six percent
9. alachlor
10. atrazine
11. Eleven
12. 3,000-30,000
13. four; two million

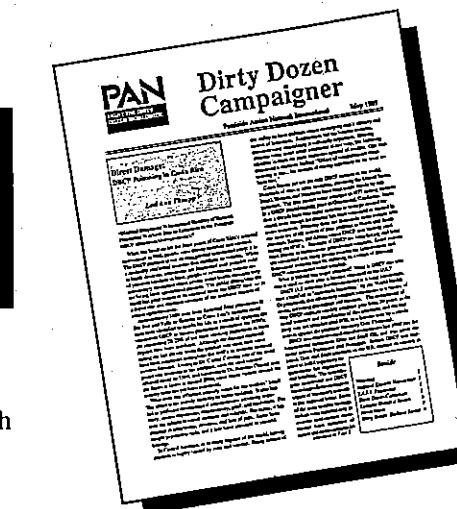
Answers to numbers 1-11 from: U.S. Environmental Protection Agency, Office of Pesticide Programs, Biological and Economic Analysis Division, Economic Analysis Branch. 1988. *Pesticide industry sales and usage*. Washington, DC.

Answers to numbers 12 and 13 from: Pekarik, Cris. 1989. Pesticides toll in developing nations—death and illness. *Between the Issues* (Ecology Action Centre, Nova Scotia) April/May:23.

International Pesticide Reform: A Survey of the World's Newsletters

By Doria Mueller-Beilschmidt and Robert Ambrose

International Newsletters Covering Pesticide Issues



Global Pesticide Monitor

Pesticide Action Network (PAN) North American Regional Center
P.O. Box 610
San Francisco, CA 94101
tel: (415) 541-9140
e-mail: ECONET: PANNA
telex: 156283472 PANNA

Annual Subscription rate: \$10-\$40 (sliding scale)/tri-annual/English.

The *Global Pesticide Monitor (GPM)* presents both information and analysis of global pesticide issues. Subjects include ecological, health, and economic aspects of the pesticide problem, debates about how to organize the pesticide reform movement to confront the corporate/government nexus, and experiences of PAN affiliates and others in the struggle against pesticide misuse. The *GPM* also examines alternatives to pesticides and their implementation in agricultural production and urban pest management around the world.

Dirty Dozen Campaigner

Pesticide Action Network (PAN) North American Regional Center
P.O. Box 610
San Francisco, CA 94101
tel: (415) 541-9140
e-mail: ECONET: PANNA
telex: 156283472 PANNA

Annual Subscription rate: \$10-\$40 US (sliding scale)/tri-annual/English.

The *Dirty Dozen Campaigner* is the newsletter for PAN International's Dirty Dozen Campaign, which targets a list of particularly hazardous pesticides for bans or severe restrictions worldwide. The Campaigner focuses on international developments related to the Dirty Dozen pesticides.

PAN EUROPE Newsletter

PAN Europe Office
Stevinstraat 115
B-1040 Brussels
Belgium
tel: (32/2) 230 07 76

Annual subscription rate: 400 Belgian francs individual; 600 non-profit/NGO*; 1200 other/(airmail)/quarterly/English.

*NGO stands for non-governmental organization.

A very informative quarterly that covers pesticide news in Europe and around the world, including coverage of PAN International activities.

Pesticides News

The Pesticides Trust
20 Compton Terrace
London N1 2UN
United Kingdom
tel: (01) 354-3860

Annual subscription rate: 25 English pounds/quarterly/English.

The *Pesticides News* is the newsletter of the Pesticides Trust. It contains abstracts of research papers, reviews of books and publications, news of pesticide regulations and restrictions, announcements of conferences, and information from the Pesticide Action Network worldwide.



Health Alert

Health Action Information Network
P.O. Box 10340
Broadway, Quezon City
Philippines
Free/monthly/English

Health Alert provides news on health-related issues, as well as economic and political developments that shape the health care situation in the Philippines. *Health Alert* contains frequent articles about pesticide issues.

GIFAB Bulletin

International Group of National Associations of Agrochemical Manufacturers
79A Avenue Albert Lancaster
B-1180 Brussels
Belgium
tel: (02) 375.68.60
telex: 62120
fax: (02) 375.27.93
Free/bi-monthly/English.

GIFAB is the international association for manufacturers of agrochemicals. The Bulletin covers GIFAB activities, as well as other significant developments and information related to international pesticide use. Often includes a supplemental item, e.g., the Newsletter of the Fungicide Resistance Action Committee in the February 1989 issue.

and announcements of educational opportunities.

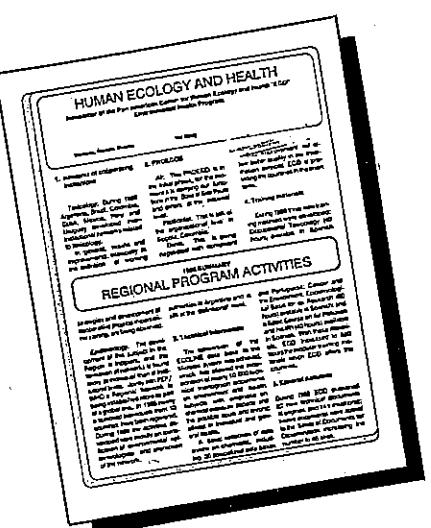


International AG-SIEVE

Rodale International
22 Main Street
Emmaus, PA 18098
tel: (215) 967-5171

Annual subscription rate: \$15 US/monthly/English.

A sifting of news in regenerative agriculture. Reprints useful articles from the world literature on sustainable agriculture. Also announces interesting research results and the publication of new resources. Rodale's international newsletter/networker.



Human Ecology and Health
Editor/ECO Publications Series
Pan American Center for Human Ecology and Health
Environmental Health Program
World Health Organization
Apartado Postal 37-473
06696 Mexico, D.F.
Mexico
telex: 174414
Free/quarterly/English or Spanish.

This newsletter publishes notices of conferences and events concerning the adverse effects on health that may result from environmental modifications accompanying industrialization, urbanization, and economic development. Small news notes are included,

The newsletter of PAN Brazil contains information about the pesticide reform movement in Brazil, along with informative articles culled from other international pesticide reform publications.

ILEIA Newsletter

Information Center for Low External Input and Sustainable Agriculture
P.O. Box 64
3830 AB Leusden
The Netherlands

Annual subscription rate: 40 Dutch florins for individuals or institutions; 25 dfl. for students/quarterly/English.

An information-intensive journal that reports original studies of rural development problems in the Third World. Each issue focuses on a specific topic, with in-depth coverage of the area from several perspectives. The general aim of ILEIA is to provide information on low external-input agriculture.



ECOFORUM

Environmental Liaison Center (ELC)
PO. Box 72461
Nairobi, Kenya
tel: 24770 or 340849
telex: 23240 ENVICENTE

Annual subscription rate: \$30 US/bi-monthly/English, French or Spanish.

ECOFORUM is a networking newsletter for non-governmental organizations around the world to share information and strategies relating to environment and sustainable development issues.

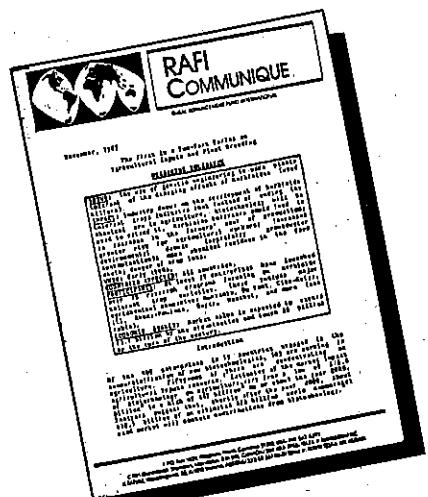
INFOPAN

INFOPAN
C.P. 947
89200, Joinville
SC, Brasil

Other Newsletters of Interest

The Manor House Agricultural Center Newsletter

The Manor House Agricultural Centre
Private Bag
Kitale, Kenya
tel: (0325) 20488



RAFI Communique

Rural Advancement Fund International
P.O. Box 1029
Pittsboro, NC 27312
tel: (919) 542-5292

Annual subscription rate: \$20 US/10 issues per year/English.

Informative bulletins with in-depth reports on agricultural technology issues such as biotechnology, genetic resource control, tissue culture, all with a focus on their effects on southern countries.

Guia del Consumidor

Revista Guia del Consumidor
Asociacion Mexicana de Estudios para Defensa del Consumidor, A.C.
Apartado Postal No. 27-060
Mexico, D.F. 06760

Annual subscription rate: \$18.00 US (airmail)/monthly/Spanish.

Newsletter of the Mexican Association of Studies for the Defense of the Consumer, that includes frequent reference to pesticide issues among other consumer issues.

Task Force Bulletin

PREPARE
India Rural Reconstruction & Disaster Response Service
H.O. 364 North Main Road
Anna Nagar, West Extension
Madras 600 181
India
tel: 654211

Free/bi-monthly/English.

UNEP North America News

United Nations Environment Programme
DC-20803 United Nations
New York, NY 10017
tel: (212) 754-8093

Free/bi-monthly/English

Hai News

Health Action International
International Organization of Consumers Unions
P.O. Box 1045
Penang, Malaysia
tel: 60-4-371396
telex: MA 40164 APIOCU
fax: 60-4-366506

Annual subscription rate: \$20 US non-profits and individuals; \$50 US others/bi-monthly/English.



Earth Island Journal

Earth Island Institute
13 Columbus Avenue
San Francisco, CA 94111
tel: (415) 788-3666

Annual subscription rate: \$15 US/quarterly/English.

A general environmental journal with occasional, informative articles about pesticide problems around the world.

Food Irradiation Newsletter

Food Irradiation Newsletter
Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture
International Atomic Energy Agency
P.O. Box 100, A-1400
Vienna, Austria
Free/2-3 per year/English.

There Goes the Injunction: Herbicides, the Forest Service, and Citizens

By Mary H. O'Brien

On May 24, 1989, a five year injunction against herbicide spraying by the Pacific Northwest Region Forest Service (Region 6: Oregon and Washington) was lifted, beginning one more chapter in a story that had any of a number of beginnings.*

Maybe the beginning was in 1943 when E.J. Krause presented a formal report on the crop-killing potential of synthetic plant hormones such as 2,4-D and 2,4,5-T to a National Academy of Sciences committee on biological warfare.

Maybe it was in 1962, the year Rachel Carson's *Silent Spring* was published, when Air Force "Operation Hades" projects began spraying herbicides (including 2,4,5-T and 2,4-D) on jungle and croplands of Vietnam.

The beginning in Oregon was surely the 1970s when rural residents began to object to the spraying of 2,4,5-T, 2,4-D, and other herbicides by the Forest Service, Bureau of Land Management (BLM), and county and private applicators above their valleys, into their watersheds, and on their roadsides.

And then, if you want a particular date, perhaps it was May 12, 1976, when, on behalf of Citizens Against Toxic Sprays (CATS), the Oregon Environmental Council, and the Hoedads treeplanting cooperative, Eugene attorney Bruce Anderson filed suit in federal court. The groups were asking the court for an injunction against spraying of 2,4-D, 2,4,5-T, and 2,4,5-TP (Silvex) in the Siuslaw National Forest, on grounds that the Forest Service environmental impact statement (EIS) on

*The historical information is drawn from Van Strum, Carol. 1983. *A bitter fog*. San Francisco: Sierra Club Books.

Mary O'Brien serves as staff scientist for the Northwest Coalition for Alternatives to Pesticides and editor of the *Journal of Pesticide Reform*.

herbicide use was inadequate.

Judge Otto Skopil ruled for the citizens in that case in 1977 (*CATS v. Bergland*: the Siuslaw National Forest did not adequately consider the health effects of 2,4,5-T and its dioxin contaminant and wrongly relied on Environmental Protection Agency (EPA) registration for an adequate consideration of effects);¹ as did . . .

Judge Helen Frye in 1982 (*Southern Oregon Citizens Against Toxic Sprays (SOCATS) v. Clark*)² the Medford District BLM did not identify scientific uncertainty and data gaps for herbicides); . . .

"Judge Burns' order was the most far-reaching: the Pacific Northwest Forest Service and Oregon BLM were to spray no herbicides at all . . . until the agencies prepared EISs that complied with the National Environmental Policy Act."

Judge Robert Belloni in 1983 (*Merrell v. Block*)³ the Siuslaw National Forest wrongly relied on EPA pesticide registration for complying with EIS regulations; and *Save Our ecoSystems v. Clark*:⁴ the Eugene District BLM's EIS worst-case analysis was inadequate and did not allow a 45-day public comment period); . . .

the Ninth Circuit Court of Appeals in 1983 (*SOCATS v. Clark*) and 1984 (*SOS v. Clark* and *Merrell v. Block*); and, finally . . .

Judge James Burns in 1984 (*NCAP v. Block*)⁵ Region 6 Forest Service and Oregon BLM illegally relied on EPA registration when an independent en-

vironmental assessment is required). (See *NCAP News* 4(1):34-36.)

Judge Burns' order was the most far-reaching: the Pacific Northwest Forest Service and Oregon BLM were to spray no herbicides at all, whether for research, nursery, roadside, recreational, noxious weed, or forestry purposes until the agencies prepared EISs that complied with the National Environmental Policy Act.

The Pacific Southwest Region Forest Service (Region 5), fearing similar litigation, voluntarily halted its use of herbicides and the U.S. Forest Service halted aerial application of herbicides nationwide. Neither of these actions involved seeing the light; they were wait-and-see temporizing.

A New Ballgame

The Forest Service emerged from under the 1984 injunction on May 24, 1989 when NCAP (acting as well for plaintiffs Oregon Environmental Council and Portland Audubon Society), Paul Merrell (of *Merrell v. Block*), Oregonians for Food and Shelter (a pesticide organization and intervenor in *NCAP v. Block* on behalf of the Forest Service), and the Forest Service submitted a joint motion to Judge Burns to dissolve the injunction.

What has been going on these five years and why is NCAP sufficiently satisfied to move for a dissolution of the Forest Service herbicide injunction?

1986-1988: NCAP Assists a Listening Forest Service

In the spring of 1986, the Pacific Northwest Region Forest Service approached NCAP with a request: that NCAP provide them with help in writing a vegetation management EIS that would address the spirit as well as the regulations of the National Environmental Policy Act (NEPA) which govern the preparation of EISs. NCAP responded that the Forest Service would need to agree to do two things: prepare a comprehensive range of reasonable alternatives for their vegeta-

tion management program and address the toxicology of herbicides more adequately than by a concocted, numerical risk assessment.

"NCAP [indicated] that the Forest Service would need to agree to do two things: prepare a comprehensive range of reasonable alternatives for their vegetation management program and address the toxicology of herbicides more adequately than by a concocted, numerical risk assessment."

Thus began two and a half years of work with the Forest Service: NCAP assisted the involvement of numerous citizens and groups in the EIS process, prepared a workshop for Forest Service administrators, spoke at numerous Forest Service gatherings, provided for Forest Service presentations at NCAP gatherings, met repeatedly with the EIS team, provided ideas and information for alternatives and herbicide toxicology discussions, reviewed drafts, provided extensive comments on the Draft EIS, and insisted on critical considerations (see "Beyond Litigation: When Plaintiffs and Defendants Work Together on Forestry and Herbicides," *JPR* 7(1):21-28).

In December, 1988, the Final EIS (*Managing Competing and Unwanted Vegetation*) and Record of Decision were issued. The preferred alternative for vegetation management was to reduce reliance on herbicides and slashburning, emphasize prevention of vegetation problems, give priority over herbicides to nonchemical methods of treatment, and mandate consideration of vegetation management at the planning stage for any project (e.g., timber cutting, road construction, or range "improvement").

The EIS provided an unusually candid survey of phenoxy herbicide epidemiology, a first attempt at discussing the quality (and lack thereof) of herbicide toxicological studies, and a qualitative (as opposed to merely quantitative) analysis of the risk associated with various herbicides. (The EIS also included

one more indefensible quantitative risk assessment by Labat-Anderson Inc.)

The Record of Decision indicated that, in addition to the EIS's elimination of amitrole (high risk of cancer and general health, reproductive, and fetal health damage), and fosamine and diuron (insufficient toxicological information), 2,4-D will be used only as a last resort. Vegetation that has been treated with herbicides cannot be slashburned for a year.

Problems with the Final EIS

Two major sticking points remained for NCAP: (1) The final EIS did not indicate how the preferred alternative would be implemented and in fact (apparently inadvertently) proposed a 26 percent increase in acreage to be annually sprayed compared to 1982 and 1983; and (2) failed to address a number of critical information points raised by NCAP in comments on the Draft EIS. In addition, Paul Merrell objected to the failure of the EIS to address issues of dioxin contamination of the Coast Range and cumulative effects of herbicides.

Therefore, when, on January 24, 1989, the Forest Service filed a motion in Judge Burns' court to dissolve the 1984 injunction, NCAP filed opposition to this motion and Paul Merrell filed to intervene in the NCAP case.

Meditated Negotiations

Wishing to avoid more court bloodletting, Judge Burns asked the plaintiffs and defendants to attempt mediated negotiations. These negotiations proceeded throughout March, April, and early May with Oregon mediators Elaine Hallmark, Brian Johnston, and Sid Lezak, the Forest Service (Dave Caraher and Mike Schafer), NCAP (Norma Grier and Mary O'Brien), Paul Merrell, Oregonians for Food and Shelter (Terry Witt), and the Justice Department in Washington, DC (Allan Brock). Ralph Bradley, the *NCAP v. Block* (and *SOS v. Clark*) attorney, assisted NCAP with their negotiations and participated in the negotiations regarding final legal arrangements.

The outcome of the negotiations? A mediated agreement, enforceable legally, that includes the following:

- Clarification of "prevention" and 2,4-D as a remedy of last resort" and repudiation of treatment acreages as predicted in the EIS.

- Provision for a Regional Coordinator to monitor agency compliance

with the EIS and negotiated agreement, serve as a contact with the public, and arrange an annual meeting with the public to address progress and difficulties of the vegetation management program.

- Requirements for site specific analysis that will insure consideration of the actual roles being played by vegetation, possible prevention of vegetation problems, comprehensive cost-accounting of all alternatives, and information needs.

- Requirements for monitoring the intended and unintended effects of Region-wide and site-specific vegetation management projects.

- Provision for systematically collecting, retaining, and annually summarizing worker and citizen complaints regarding the Region's use of herbicides and slashburning.

- Commitment to prepare an information package for each herbicide, including responsible anecdotal information on adverse effects; potential or observed effects on humans, fish, and wildlife; discussion of whether the "inert" ingredients in the formulation have been revealed by the manufacturer; and an indication of whether validated analytical methods exist for analyzing the herbicide in water.

The information packets will be revised regularly to incorporate new information (e.g., the annual summary of worker and citizen health complaints).

"Wishing to avoid more court bloodletting, Judge Burns asked the plaintiffs and defendants to attempt mediated negotiations."

The information packets will be revised regularly to incorporate new information (e.g., the annual Forest Service summary of worker and citizen health complaints).

- Commitment to (a) further examine the nature and extent of 2,4-D contamination with 2,3,7,8-TCDD (the most toxic dioxin) and additional findings regarding 2,4-D and malignant lymphoma, and (b) determine whether or not burning vegetation that has been treated with chlorinated herbicides releases toxic chlorinated compounds into the environment.

The Final EIS does not, in the last analysis, address the dioxin issues Paul Merrell has raised, but Merrell signed the mediated agreement because the agreement explicitly retains his right to raise all relevant issues if he decides to litigate an environmental assessment document regarding herbicide use in the Siuslaw National Forest. He agrees to seek relief only in the Siuslaw National Forest, but is not limited to questioning the entire EIS if that document is relied upon by the Forest Service. The Siuslaw National Forest, in other words, will have to either forgo the use of herbicides, address dioxin issues in an environmental document regarding herbicide use, or face Merrell in court.

Following consultation with Oregon Environmental Council and Portland Audubon Society, NCAP signed the agreement.

What next?

The show is not over, because herbicides are still being used in the Forest Service. The Oregon BLM was simultaneously enjoined from using herbicides in 1984, and they want to resume herbicide dependence again for vegetation management. The following are related areas in which NCAP will be working during the coming months and years:

1. The Forest Service will be preparing site-specific environmental documents (environmental assessments or EISs) for vegetation management projects that propose utilization of herbicides. NCAP will prepare a training booklet for citizens to use as they monitor, contribute to, and object to Forest Service vegetation management plans locally. The EIS and mediated agreement are only as good as their implementation and the implementation will be far better if environmentally knowledgeable citizens actively contribute to the process.

2. NCAP will vigorously oppose any proposals to use 2,4-D or 2,4-DB anywhere in the Region. (Throughout the preparation of the EIS, NCAP had strongly opposed the retention of these herbicides in the Region's program.)

3. NCAP will participate in the Forest Service process of implementing the mediated agreement, including their preparation of the information packages on the herbicides.

4. NCAP is assisting California Coalition for Alternatives to Pesticides and the University of Oregon Western

Natural Resources Law Clinic as they contemplate legal action against the Pacific Southwest Forest Service Region (California), challenging their newly-released Final EIS for vegetation management.

While the Pacific Northwest Region of the Forest Service decided to prepare a brand new vegetation management EIS following the 1984 court injunction, the Southwest Region decided to merely supplement its 1983 Draft EIS with a 1986 quantitative risk assessment of its herbicide active ingredients. Their 1989 Final EIS is their inadequate 1983 vision of vegetation management warmed over.

"The show is not over, because herbicides are still being used in the Forest Service and the BLM for vegetation management."

5. In May, 1989, NCAP submitted extensive comments on the BLM's *Western Oregon Program—Management of Competing Vegetation, Final Environmental Impact Statement*. Like the Pacific Southwest Region Forest Service, Oregon BLM is stonewalling: the agency has merely released a warmed-over version of its inadequate 1983 Draft EIS.

The BLM joined the Forest Service in hiring Labat-Anderson Inc. to concoct a quantitative risk assessment for the herbicides both agencies use, and called that a 1986 Supplement to their Draft EIS. NCAP will likely litigate against the BLM if it asks Judge Burns to lift the *NCAP v. Block* herbicide injunction on the basis of its vegetation management EIS.

We will move forward from here. NCAP will continue to operate on the understanding that it is inappropriate to manage forest ecosystems by throwing poisons at them.

The BLM survived a 1987 NCAP challenge against its noxious weed EIS; Judge Burns lifted the injunction for that program (JPR 7(4):29-30; 8(2):30).

6. NCAP will be encouraging citizen groups throughout North America to study, use, and improve upon the information and policies in the Pacific Northwest Region Forest Service vegetation management EIS and its accompanying mediated agreement.

Do You Have A Copy of the Pacific Northwest Region Vegetation Management EIS?

For copies of the Pacific Northwest Region Forest Service vegetation management EIS and mediated agreement contact Dave Caraher, Pacific Northwest Region, USDA Forest Service, P.O. Box 3623, Portland, OR 97208.

The EIS consists of seven volumes:

1. Record of Decision (27 pp.)
 2. Final Environmental Impact Statement (505 pp.)
 3. Characterization and Management of Risk (119 pp.)
 4. Appendices A,B,C,E,F,G,J,K (243 pp.)
 5. Appendices D and H (quantitative and qualitative risk analyses; 509 pp.)
 6. Appendix I/A (public comments and consultation, approx. 509 pp.)
 7. Appendix I/B (public comments, approx. 500 pp.)
- Plus Mediated Agreement

Conclusion

Some Forest Service insiders speak of the "180 degree turn" that has taken place within the Pacific Northwest Region of the Forest Service regarding vegetation management and herbicides since the injunction of 1984. The Forest Service has certainly been willing to listen, learn, and make some interesting decisions.

We will move forward from here. NCAP will continue to operate on the understanding that it is inappropriate to manage forest ecosystems by throwing poisons at them.

References

1. *Citizens Against Toxic Sprays (CATS) v. Bergland* USDC Oregon Civil No. 76-438.
2. *Southern Oregon Citizens Against Toxic Sprays (SOCATS) v. Clark*. USDC Oregon Civil No. 79-1098.
3. *Merrell v. Block*. USDC Oregon Civil No. 81-6138-E.
4. *Save Our ecoSystem (SOS) v. Clark*. USDC Oregon Civil No. 83-6090-E.
5. *NCAP v. Block*. USDC Oregon Civil No. 83-6272-E.

NCAP'S BOARD

Introducing Allen Cook and Ned Bowler

The first thing Ned Bowler will cheerfully tell you is that he lives in Bliss. That seems a sensible thing to do once you have retired. Ned trained speech therapists for 23 years at the University of Colorado (Boulder) after having taught at Stanford and Long Beach State. The move to Bliss, ID in 1981 with his wife Robin meant coming home. Ned had grown up a few miles away in Gooding.

Living in Bliss doesn't remove someone like Ned from environmental problems, however. He is active with the Hagerman Valley Citizens Alert, an organization that addresses Idaho water quality issues.

The organization has been working for six years to get the Snake River aquifer designated as a sole source by the Environmental Protection Agency, and the process continues today.

Contamination from injection wells and confined dairy herds as well as other sources poses a threat to the pure spring water that pours out of the canyon walls in his region.

That clean water supports the largest aquaculture operations for production of commercial trout in the nation.

Ned is particularly interested in public trust doctrine, a legal tool that recognizes the environment belongs to everyone even though it has often been treated as if it were private property. Having followed two public trust doctrine cases in Idaho, Ned appreciates how the doctrine can be used to protect water and other environmental resources superceding local politics.

Ned first learned of NCAP when his Boise brother, another longtime environmental activist, was contacted by NCAP regarding the Board of Directors. Ned feels that the next environmental issue facing Idaho is pesticide reform so Ned's presence on the Board offers the coalition his experience with Idaho and its particular environmental needs; NCAP offers Ned our experience with pesticides.

Allen Cook has been familiar with pesticides for a longer time than Ned. Allen has retained a research pesticide license throughout most of the past 15 years. Almost thirty years a plant researcher, Allen works mostly with the genetics of plants, trying to develop cereal crops that are, among other characteristics, adapted to the Northwest, disease resistant, and nutritious.

With an office in Montana State University (MSU) at Bozeman, Allen's employer for the past ten years has been the Agricultural Research Service of the U.S. Department of Agriculture.

Allen too lives in bliss. He and his wife Renee (a computer specialist in the MSU microbiology department) are living in (and building) their own house at 6500' in a Douglas fir/sage meadow area of Bridger Canyon.

While the home-building is a 20-year process, Allen and Renee were able to move in from their tepee after three years on the site. In winter they ski home anywhere from one



Allen Cook

quarter mile to two miles depending on road conditions. The two will have electricity in their home when they complete their current solar photovoltaics project.

Allen's service to NCAP stems from his love of ecology. Pesticides seem to be a largely negative factor in ecosystems. While our society is currently in the mode of using pesticides, Allen feels we need to work strongly to get out of that mode. He would like to see agriculture become more of an ecological science rather than almost exclusively a production science.

"I think," comments Allen, "that most farmers, most producers, would like to eliminate the use of pesticides. Pesticides are expensive to buy and expensive to apply. Most farmers recognize the hazards pesticides pose to them, their family, and the environment. Deep down, most farmers feel that nonchemical management techniques, plant resistance, and biological control would be more desirable."

With Allen and Ned on NCAP's Board of Directors, NCAP is moving in that direction. In addition to their environmental knowledge and experience, both Ned and Allen provide a kindness and cheerfulness that make NCAP Board Meetings not only effective, but good.

Mary O'Brien



Ned Bowler

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Information Packets

- Pesticide Information Packet.** Nina Groutage and Lois Yoshishige, 1984. Forty introductory articles on pesticide issues. 132 pages, \$13.50.
- On the Trail of a Pesticide.** Mary H. O'Brien, 1984. An excellent guide to learning about the chemistry, effects, and testing of pesticides. 166 pages, \$16.00.
- Pesticide Exposure and the Role of the Physician.** Jennifer Curtis, 1986 (updated 1988). A collection of articles covering pesticide health effects, epidemiology, legal issues, and occupational health concerns. 87 pages, \$11.00.
- Avoiding Trouble Down the Road: A Policy Guide for Managing Roadside Vegetation.** Ron McMullen, 1988. A collection of articles dealing with why, what, and how roadside vegetation management policies and practices should and can be changed. 165 pages, \$15.00.
- Planning for Non-Chemical School Grounds Maintenance.** Updated by Ron McMullen, 1986. This packet deals with the model integrated pest management policy of the Eugene School District. A useful guide for parents and schools contemplating reduction of pesticide use. 80 pages, \$10.50.
- Farmworkers and Other Workers: Pesticide Damage and Reform.** Fifteen articles from the *Journal of Pesticide Reform*, 1986. 36 pages, \$5.00.
- Preparing an Excellent Pesticide Environmental Impact Statement.** Mary O'Brien, 1987. A guide for federal agencies and citizens using the National Environment Policy Act to develop alternative pest management programs and describe their impacts. 100 pages, \$12.00.
- How to Use the Freedom of Information Act.** (Federal, California, Oregon, Washington and Idaho) 1983. 10 pages, \$3.00.
- Every Drop Matters: A Guide to Preventing Groundwater Contamination.** Neva Hassanein and Ivy Cotler, 1989. Provides information on pesticides in groundwater, emerging policy issues, and avenues for individual and community action to prevent groundwater degradation. 111 pages, \$12.00.

_packets on Pesticide Chemicals

- Glyphosate (Roundup) Information Packet.** Compiled by Karen Talberth, Lois Yoshishige, and Margie Juris, 1985. 114 pages, \$13.00.
- 2,4-D Information Packet.** Compiled by Michael Slattery, Nina Groutage, and Mary O'Brien, 1983. 186 pages, \$17.50.
- PCP Information Packet.** Morris Sweet, 1984. 130 pages, \$13.00.
- Ten Common Classes of Pesticides:** An Appendix from *On the Trail of a Pesticide*. Mary H. O'Brien. 33 pages, \$5.00.

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Amitrole.	Diazinon.	Triclopyr.
Asulam.	Dicamba.	Inerts.
Atrazine.	2,4-D.	Pesticides in Soil.
<i>Bacillus thuringiensis</i> (B.t.)	Glyphosate.	EPA Registration.
Carbaryl.	Malathion.	Will That Pesticide Leach?
Chlorpyrifos.	Picloram.	TCDD (dioxin).
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